



Common Council

Regular Meeting

335 South Broadway
De Pere, WI 54115
<https://www.deperewi.gov/>

Agenda

Tuesday, November 17, 2020

7:30 PM

Pursuant to Wisconsin Statutes 19.84, Notice is hereby given to the public that a meeting of the **Common Council** of the City of De Pere will be held on **November 17, 2020** at **7:30 PM**.

Due to the current public health emergency, the meeting will be held electronically and the public may attend this meeting electronically or telephonically by accessing either:

Please join my meeting from your computer, tablet or smartphone.

<https://www.gotomeet.me/DePere>

You can also dial in using your phone.

United States (Toll Free): [1 866 899 4679](tel:18668994679)

United States: [+1 \(312\) 757-3117](tel:+13127573117)

Access Code: 154-883-285

THIS MEETING WILL NOT BE HELD IN PERSON.

This meeting may also be rebroadcast on TV throughout the week and available on demand at <http://deperecitywi.igmp2.com/>.

I. Call to Order

1. Roll Call
2. Approval of the Minutes of the November 4, 2020 Common Council Meeting.
3. Public Hearing on the proposed Budget for calendar year 2021.
 - A. Presentation of 2021 Budget.
 - B. Notice of Public Hearing.
 - C. Approval of proposed 2021 Budget.
 - D. Resolution #20-117 Adoption of Tax Levy for City Purposes to Support the 2021 City Budget.
4. Public Hearing on the vacation of a public thoroughfare (200 block South Wisconsin Street adjacent to Parcels ED-812 and ED-920).
 - A. Notice of Public Hearing.
 - B. Recommendation from the Plan Commission.
 - C. Resolution #20-105 Regarding the Vacation of a Public Thoroughfare (200 Block South Wisconsin Street Adjacent to Parcels ED-812 and ED-920).
5. Proclamation in Appreciation and Gratitude to Poll Workers and Staff for Service During the November General Election.

6. Recommendation from Finance/Personnel Committee to accept donation of two ice dispensing machines from Humana for the Fire Dept.
7. Recommendation from the License Committee on a request by Dylan Doxtater-Gillis to appear before the License Committee regarding denial of his Operator License Application.
8. Recommendation from the License Committee on a request by the Chief of Police to conduct a pre-hearing on the Class B Combination Liquor License issued to Crystal Jenss (DBA On The Rocks Bar) 413 Main Ave. based upon allegations of liquor license regulation violations.
9. Ordinance #20-20 Amending Chapter 150 De Pere Municipal Code Regarding Traffic Regulations (Schedule G. Parking and Schedule C. Yield Right-of-Way Intersections).
10. Ordinance #20-21 Creating Chapter 23 De Pere Municipal Code Regulating the Application and Sale of Coal Tar and Other High-PAH Sealant Products.
11. Res #20-118 Preliminary Resolution Declaring Intention to Exercise Special Assessment Powers Under Section 66.0703, Wis. Stats., Sanitary Sewer and Water Main, Storm Sewer and Storm Water Management (Garroman Drive).
12. Resolution #20-119 Establishing Pandemic Response - Downtown Business Aid Program
13. Resolution #20-120 Granting Two Planning Options to Purchase to Howard Immel, Inc. (Venture Avenue and Profit Place).
14. Resolution #20-121 Regarding the Vacation of a Public Thoroughfare (500 Block of Charles Street; adjacent to Parcels ED-914 and ED-920) - Refer to Public Hearing.
15. Voucher approval.
16. COVID-19 update from the Health Department.
17. Future agenda items.
18. Adjournment.

Carey Danen
City Clerk

Any person wishing to attend this meeting who, because of disability, requires special accommodations should contact the Clerk's office at 339-4050 by Noon, the previous day so that arrangements can be made.

Agenda Sent To:
Alderspersons
City Administrator
Mayor
Department Heads
TV, Newspapers & Radio Stations
Kress Family Library
De Pere Chamber of Commerce
Crystal Jenss On the Rocks Bar
Dylan Doxtater-Gillis



City of De Pere, Wisconsin

Request For Common Council Action

MEETING DATE: November 17, 2020

DEPARTMENT: City Attorney

FROM: Angela Zills

SUBJECT: Approval of the Minutes of the November 4, 2020 Common Council Meeting.

ATTACHMENTS:

- 11-4-20 Minutes-DRAFT (PDF)



Common Council

Regular Meeting

335 South Broadway
De Pere, WI 54115
<https://www.deperewi.gov/>

Draft Minutes

Wednesday, November 4, 2020

7:30 PM

1. Call to Order. The meeting was called to order at 7:30 PM by Mayor Boyd.

Attendee Name	Title	Status	Arrived
Dan Carpenter	Aldersperson	Present	
Mike Eserkaln	Aldersperson	Present	
Jonathon Hansen	Aldersperson	Late	7:40 PM
Amy Chandik Kundinger	Aldersperson	Present	
Shana Defnet Ledvina	Aldersperson	Present	
Casey Nelson	Aldersperson	Present	
Dean Raasch	Aldersperson	Present	
Kelly Ruh	Aldersperson	Present	
James Boyd	Mayor	Present	

2. Approval of the minutes of the October 20, 2020 Common Council meeting.

RESULT: APPROVED [UNANIMOUS]
MOVER: Casey Nelson, Aldersperson
SECONDER: Dan Carpenter, Aldersperson
AYES: Carpenter, Eserkaln, Kundinger, Defnet Ledvina, Nelson, Raasch, Ruh
ABSENT: Jonathon Hansen

3. Recommendation from Plan Commission to approve a Precise Implementation Plan (PIP) for a proposed new restroom and dump station on the Brown County Fairgrounds at 1500 Fort Howard AV (Parcels WD-57, WD-67, WD-70-1).

RESULT: APPROVED [UNANIMOUS]
MOVER: Dean Raasch, Aldersperson
SECONDER: Casey Nelson, Aldersperson
AYES: Carpenter, Eserkaln, Kundinger, Defnet Ledvina, Nelson, Raasch, Ruh
ABSENT: Jonathon Hansen

4. Ordinance #20-19 Establishing Salaries for Elected Officials for the City of De Pere (2022 and 2023) (Second Reading)

RESULT: ADOPTED [UNANIMOUS]
MOVER: Dean Raasch, Aldersperson
SECONDER: Dan Carpenter, Aldersperson
AYES: Carpenter, Eserkaln, Kundinger, Defnet Ledvina, Nelson, Raasch, Ruh
ABSENT: Jonathon Hansen

5. Resolution #20-113 Ratifying Mayoral Proclamations Issued From October 3, 2020 Through October 30, 2020.

Upon further discussion, Aldersperson Raasch asked whether additional security is required for posting a gun-free zone to which City Attorney Judith Schmidt-Lehman advised that there is no requirement under Posting Law that security be required. Currently, City Hall and all City facilities are posted that way, with no additional security. In response to Aldersperson Raasch's question as to whether there is additional

liability to citizens as a result of posting, City Attorney Schmidt-Lehman advised that the City is immune from this type of decision under its governmental immunity.

RESULT:	ADOPTED [6 TO 1]
MOVER:	Shana Defnet Ledvina, Alderperson
SECONDER:	Casey Nelson, Alderperson
AYES:	Carpenter, Eserkaln, Kundinger, Defnet Ledvina, Nelson, Ruh
NAYS:	Dean Raasch
ABSENT:	Jonathon Hansen

6. Resolution #20-114 Suspending 2021 Common Collection Assessment.

Upon further discussion, Alderperson Raasch expressed that suspending the collection charge for all of 2021 may be far-reaching if the situation changes in 3-4 months, and wondered if there was another way to pass on the cost or find a way to support businesses differently. Administrator Delo explained that the assessment is done on an annual basis, so there is no way to divide it differently, as the assessment goes to the county for the calendar year. In response to Alderperson Carpenter, Administrator Delo advised that the assessment is tied to a parcel and transfer or closing of individual businesses wouldn't change the assessment.

In response to Alderperson Raasch, Public Works Director Scott Thoresen advised that the assessment goes to the property owner of the parcel. Alderperson Raasch clarified that the property owner may be the one benefitting from free collection and not necessarily the business owner; he would like to do something different to benefit businesses. PW Director Thoresen indicated that of the 25 impacted parcels, there are actually quite a few business owners who also own the property and are getting the assessment. Mayor Boyd added that property owners struggle as well, and this is one attempt of many to assist over the next 6-9 months.

Alderperson Carpenter asked whether in a Friday Memo or future agenda item if it could be identified if property owners also own the business at the impacted locations. PW Director Thoresen indicated he had that information and that half of 25 own the building as well as the business. Alderperson Raasch reiterated that this item is for property owners and not for businesses, as he wants to make it clear that it is coming across in that way.

RESULT:	ADOPTED [UNANIMOUS]
MOVER:	Dan Carpenter, Alderperson
SECONDER:	Amy Chandik Kundinger, Alderperson
AYES:	Carpenter, Eserkaln, Hansen, Kundinger, Defnet Ledvina, Nelson, Raasch, Ruh

7. Resolution #20-115 Terminating Suspension of Overnight Parking Restrictions.

RESULT:	ADOPTED [UNANIMOUS]
MOVER:	Dan Carpenter, Alderperson
SECONDER:	Dean Raasch, Alderperson
AYES:	Carpenter, Eserkaln, Hansen, Kundinger, Defnet Ledvina, Nelson, Raasch, Ruh

8. Resolution #20-116 Authorizing \$21,250 Donation to Downtown De Pere Inc. (d/b/a Definitely De Pere) for "Buy Local" Marketing Campaign.

Upon further discussion, Alderperson Hansen verified that this is something that the City's Communications Specialist could help promote. Both Mayor Boyd and Administrator Delo confirmed that the City could promote this initiative as much as Definitely De Pere would request.

Alderperson Raasch asked about funding, to which Mayor Boyd indicated that this is the remaining \$21,250 of funds from the \$50,000 that was allocated earlier.

Mayor Boyd added there are more initiatives to come and welcomed other suggestions be proposed in the future.

RESULT:	ADOPTED [UNANIMOUS]
MOVER:	Casey Nelson, Alderperson
SECONDER:	Shana Defnet Ledvina, Alderperson
AYES:	Carpenter, Eserkaln, Hansen, Kundinger, Defnet Ledvina, Nelson, Raasch, Ruh

9. Voucher approval.

RESULT:	APPROVED [UNANIMOUS]
MOVER:	Jonathon Hansen, Alderperson
SECONDER:	Casey Nelson, Alderperson
AYES:	Carpenter, Eserkaln, Hansen, Kundinger, Defnet Ledvina, Nelson, Raasch, Ruh

10. COVID-19 update from Health Department.

Health Director/Officer Deborah Armbruster indicated that the department's reporting attempted to accommodate suggestions made, so that the numbers shown are those with the highest concern. She reported a COVID death of a 39 year old female in the City; that Prevea has opened a winter testing site at the Brown County Fairgrounds to include testing with no symptoms; in the past week, more testing is being done and Prevea, through the government, has the ability to conduct surveillance testing as well; the West De Pere schools are in session and the Unified schools will continue virtually until 11/30; St. Norbert College will be out of session in about two weeks until early February; the Health Department will work with the school in spring for conducting surveillance testing when students return; the federal government is supporting antigen testing for the UW system main campuses with staffing and testing kits, but an appointment is needed and logistics are in process; she feels the Community is in good shape with available testing; the department is working with school nurses daily and developing plans for when vaccines become available.

In response to Mayor Boyd, Health Director/Officer Armbruster indicated she has not been informed of a time-frame for vaccinations yet. Alderperson Raasch thanked the Health Department for the changes made to the reporting and expressed concern of a possible rumor on social media regarding a recent COVID death; Health Director/Officer Armbruster did not have any information on that. Alderperson Eserkaln asked about the fairgrounds testing site, whether there is a testing limit to prevent individuals from requesting excessive testing, to which Health Director/Officer explained that an

appointment is needed and since testing was down, the state is allowing testing without symptoms now, and while changes may occur as time goes on, the government wants testing done. Alderperson Hansen confirmed that vaccines will likely require two shots. Alderperson Carpenter confirmed that antibody testing can be done, for example, with blood donations. Health Director/Officer Armbruster confirmed more antibody testing will be coming, but for now the community is in response-mode and that type of testing might not be as helpful if it is determined antibodies only last 90 days; however, that testing is available from providers, if requested.

RESULT:	DISCUSSED
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11. Future agenda items.

Alderperson Kunding advised that the State of De Pere event is scheduled virtually for January 12, 2020, in partnership among the De Pere Chamber, Definitely De Pere, St. Norbert College and the City.

Mayor Boyd congratulated Alderperson Ledvina on her new baby.

RESULT:	DISCUSSED
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12. Adjournment.

Upon Motion of Alderperson Nelson, seconded by Alderperson Raasch, the meeting of the Common Council adjourned at 8:06 PM by unanimous vote.

Respectfully submitted,
Angela Zills



City of De Pere, Wisconsin

Request For Common Council Action

MEETING DATE: November 17, 2020

DEPARTMENT: Finance Department

FROM: Joe Zegers

SUBJECT: D. Resolution #20-117 Adoption of Tax Levy for City Purposes to Support the 2021 City Budget.

The budget document can be found at the following link:
https://www.deperewi.gov/egov/documents/1604344487_15696.pdf

ATTACHMENTS:

- Reso20-117 (PDF)
- 2021 Budget Hearing Publication - 10-26-20 (PDF)

RESOLUTION #20-117

ADOPTION OF TAX LEVY FOR CITY PURPOSES TO
SUPPORT THE 2021 CITY BUDGET

WHEREAS, the De Pere Finance/Personnel Committee has reviewed the proposed 2021 City Budget; and

WHEREAS, a public hearing regarding proposed 2020 City Budget was held on November 17, 2020; and

WHEREAS, after due deliberation and public discussion, the De Pere City Council is desirous of adopting a tax levy to support the 2021 City Budget;

NOW, THEREFORE, BE IT HEREBY RESOLVED:

That the De Pere Common Council hereby approves the 2021 Budget as presented; further the Common Council adopts a total 2020 property tax levy to support the City's 2021 Budget and that this levy be further apportioned according to the following: General Fund (\$8,285,197); Debt Service (\$3,869,027); Capital Projects (\$1,742,276); and Local Levy TID Districts (\$1,175,788).

Adopted by the Common Council of the City of De Pere, Wisconsin, this 17th day of November, 2020.

APPROVED:

 James G. Boyd, Mayor

ATTEST:

 Carey E. Danen, City Clerk

Ayes: _____

Nays: _____

2021 BUDGET CITY OF DE PERE, WISCONSIN

The Common Council of the City of De Pere will hold a public hearing on the proposed budget for calendar year 2021 on Tuesday, November 17, 2020, commencing at 7:30 p.m. Due to the current health emergency, the meeting will be held electronically and the public may attend this meeting electronically or telephonically by accessing either <https://www.gotomeet.me/DePere> or by phoning toll free 1-866-899-4679 or 1-312-757-3117 Access Code 154-883-285. Notice is hereby given that the details of the proposed Budget will be on file in the Clerk's office in City Hall beginning on November 2nd, 2020 and will be open for public inspection during regular office hours. A summary of the proposed budget is published herewith.

Dated this 2nd day of November, 2020
Carey Danen - City Clerk- City of De Pere, Wisconsin

<u>GENERAL FUND</u>	<u>2019 ACTUAL</u>	<u>2020 ESTIMATED</u>	<u>2020 ADOPTED BUDGET</u>	<u>2021 PROPOSED BUDGET</u>	<u>PERCENT CHANGE</u>
<u>REVENUES</u>					
Taxes (other than property)	\$552,040	\$559,620	\$544,820	\$545,320	
Public Improvements	\$15,788	\$10,000	\$20,000	\$20,000	
Intergovernmental	\$3,303,419	\$3,497,307	\$3,481,336	\$3,377,051	
Licenses and Permits	\$692,896	\$1,042,119	\$678,650	\$912,900	
Fines, Forfeitures & Penalties	\$425,638	\$335,000	\$415,000	\$410,000	
Public Charges for Services	\$1,565,235	\$1,508,290	\$1,725,126	\$1,836,945	
Intergovernmental Charges for Services	\$1,324,327	\$1,142,572	\$1,219,210	\$1,230,190	
Miscellaneous	\$783,151	\$561,490	\$617,020	\$575,590	
Fund Balance Applied	\$0	\$0	\$0	\$0	
Transfers from Other Funds	\$1,311,400	\$1,311,400	\$1,311,400	\$1,311,400	
TOTAL GENERAL FUND REVENUES	\$9,973,894	\$9,967,798	\$10,012,562	\$10,219,396	2.07%
<u>EXPENDITURES</u>					
General Government	\$1,617,792	\$1,725,158	\$1,834,957	\$1,822,308	
Other General Government	\$265,972	\$286,000	\$317,966	\$483,050	
Public Safety	\$9,193,774	\$9,539,242	\$9,699,182	\$9,652,615	
Public Works	\$2,322,468	\$2,291,048	\$2,241,834	\$2,289,994	
Solid Waste & Recycling	\$729,742	\$753,666	\$642,304	\$757,852	
Health & Social Services	\$501,685	\$534,692	\$554,389	\$568,132	

Culture, Recreation & Education	\$2,084,992	\$1,990,254	\$2,262,993	\$2,467,540	
Conservation & Development	\$348,822	\$373,082	\$332,213	\$378,862	
Capital Outlay	\$789,995	\$668,698	\$273,614	\$84,240	
Contingency Fund	\$0	\$0	\$0	\$0	
Transfer to Other Funds	\$30,333		\$0	\$0	
TOTAL GENERAL EXPENDITURES	\$17,885,575	\$18,161,840	\$18,159,452	\$18,504,593	1.90%
EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES	(\$7,911,681)	(\$8,194,042)	(\$8,146,890)	(\$8,285,197)	1.70%
General Fund Property Tax Levy	\$8,202,551	\$8,146,890	\$8,146,890	\$8,285,197	1.70%
GENERAL FUND SURPLUS (DEFICIT)	\$290,870	(\$47,152)	\$0	\$0	
<u>SPECIAL REVENUE FUNDS</u>					
Revenues	\$266,825	\$169,900	\$168,622	\$220,588	30.82%
Expenditures	(\$162,499)	(\$500,463)	(\$150,921)	(\$135,785)	-10.03%
EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES	\$104,326	(\$330,563)	\$17,701	\$84,803	-379.09%
SPECIAL REVENUE FUND PROPERTY TAX	\$0	\$0	\$0	\$0	
SPECIAL REVENUE FUND SURPLUS (DEFICIT)	\$104,326	(\$330,563)	\$17,701	\$84,803	
<u>DEBT SERVICE FUND</u>					
Revenues	\$6,424,050	\$3,611,796	\$3,611,796	\$3,325,631	-7.92%
Expenditures	(\$9,105,286)	(\$7,424,988)	(\$7,424,988)	(\$7,194,658)	-3.10%
EXCESS (DEFICIENCY) REVENUES OVER EXPENDITURES	(\$2,681,236)	(\$3,813,192)	(\$3,813,192)	(\$3,869,027)	1.46%
Debt Service Fund Property Tax Levy	\$3,730,250	\$3,813,192	\$3,813,192	\$3,869,027	1.46%
Debt Service Fund Surplus (Deficit)	\$1,049,014	\$0	\$0	\$0	

CAPITAL PROJECTS FUNDS

Revenues	\$5,856,754	\$10,822,988	\$10,822,988		-100.00%
Expenditures	(\$7,102,932)	(\$12,565,264)	(\$12,565,264)		-100.00%
EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES	(\$1,246,178)	(\$1,742,276)	(\$1,742,276)	\$0	-100.00%
CAPITAL PROJECTS FUNDS PROPERTY TAX LEVY	\$1,742,276	\$1,742,276	\$1,742,276	\$1,742,276	0.00%
CAPITAL PROJECTS SURPLUS (DEFICIT)	\$496,098	\$0	\$0	\$1,742,276	

FUND BALANCES

	<u>General Fund</u>	<u>Special Revenue</u>	<u>Debt Service</u>	<u>Capital Projects</u>	<u>Proprietary Funds</u>
Actual as of January 1, 2020	\$7,839,127	\$1,348,982	\$2,555,768	\$726,981	\$55,060,371
Projected December 31, 2020	\$7,791,975	\$1,018,419	\$1,593,803	\$726,981	\$54,953,510

CITY PROPERTY TAX LEVY

	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>Percent Change</u>
<u>General Fund</u>	\$8,202,547	\$8,146,890	\$8,285,197	1.70%
<u>Debt Service Fund</u>	\$3,730,250	\$3,813,192	\$3,869,027	1.46%
<u>Capital Projects Fund</u>	\$1,742,276	\$1,742,276	\$1,742,276	0.00%
<u>City Tax Increment Levy</u>	\$1,031,548	\$1,090,687	\$1,175,788	7.80%
<u>TOTAL TAX LEVY</u>	\$14,706,621	\$14,793,045	\$15,072,288	1.89%

CITY TAX RATES

<u>(PER \$1,000 ASSESSED VALUE)</u>	<u>\$7.07</u>	<u>\$6.76</u>	<u>\$6.50</u>	-3.80%
<u>(PER \$1,000 EQUALIZED VALUE)</u>	<u>\$6.94</u>	<u>\$6.69</u>	<u>\$6.37</u>	-4.84%



City of De Pere, Wisconsin

Request For Common Council Action

MEETING DATE: November 17, 2020

DEPARTMENT: Common Council

FROM: Peter Schleinz

SUBJECT: C. Resolution #20-105 Regarding the Vacation of a Public Thoroughfare (200 Block South Wisconsin Street Adjacent to Parcels ED-812 and ED-920).

On March 23, 2020 Plan Commission unanimously recommended approval by a vote of 7-0.

On October 6, 2020 Common Council considered the discontinuance of Wisconsin ST. The original request that was reviewed by Plan Commission also included Charles ST, which will be reviewed separately by Common Council at a future meeting.

ATTACHMENTS:

- Reso20-105-Final (DOCX)
- Exhibit A-Reso 20-105 200 BLK S Wisconsin Vacation (PDF)
- Exhibit B-Reso 20-105 200 BLK S Wisconsin Street Vacation (PDF)
- Public Hearing Notice - Wisconsin ST (PDF)
- Memo to CC - Wisconsin-Charles Discontinuance Split to Two Requests - 06 Oct 2020 (DOCX)
- ROW Vacation - S Wisconsin ST & Charles ST - Plan Commission Report (DOCX)
- Application Form (PDF)
- Discontinuance Exhibit - Wisconsin ST - L-11240 (PDF)

RESOLUTION #20-105

REGARDING THE VACATION OF A PUBLIC THOROUGHFARE
(200 Block South Wisconsin Street Adjacent to Parcels ED-812 and ED-920)

WHEREAS, the Common Council of the City of De Pere has initiated the vacation and discontinuance of a public thoroughfare in accordance with the requirements of Wis. Stats. §66.1003(4)(a); and

WHEREAS, the public interest may require the vacation of such rights-of-way; and

WHEREAS, the Plan Commission has reviewed and recommended approval of such vacation and discontinuance, with a public hearing on said vacation to be held in accordance with Wis. Stats. §66.1003(4)(b), on November 17, 2020 at 7:35 p.m.

NOW, THEREFORE, BE IT HEREBY RESOLVED THAT:

Section 1. 200 Block South Wisconsin Street, located north from Lewis Street to Charles Street, East Side of Fox River, City of De Pere, Brown County, Wisconsin more fully described on Exhibit A, attached hereto and incorporated by reference herein, be and the same is hereby wholly vacated and discontinued as a public thoroughfare. All utility easements shall be released upon relocation of the utilities. Said public right-of-way to be vacated is shown on the scale map attached hereto and incorporated by reference herein as Exhibit B.

Section 2. The City Clerk-Treasurer is hereby authorized and directed to file and record this resolution, with the legal description and map attached, in the Office of the Register of Deeds for Brown County and to amend the Official Map of the City in conformity with this Resolution.

Resolution #20-105

Page 2 of 2

Introduced to the Common Council of the City of De Pere at its regular meeting held on the 6th day of October, 2020.

Adopted by the Common Council of the City of De Pere, Wisconsin, this 17th day of November, 2020.

APPROVED:

James G. Boyd, Mayor

ATTEST:

Carey E. Danen, City Clerk

Ayes: _____

Nays: _____

LEGAL DESCRIPTION OF ROAD TO BE VACATED – S Wisconsin Street

Part of S Wisconsin Street being located in part of Private Claims 32 and 33, East Side of the Fox River, City of DePere, Brown County, Wisconsin, more fully described as follows:

Beginning at the Southeast corner of Lot 1, Volume 54, Certified Survey Maps, Page 312, Map No. 7902, Document No. 2415438, Brown County Records; thence $N0^{\circ}38'17''E$, 128.47 feet along the East line of said Lot 1; thence 7.66 feet along said East line being the arc of a 10.00 foot radius curve to the left whose long chord bears $N21^{\circ}17'46.5''W$, 7.47 feet; thence 25.27 feet along said East line being the arc of a 33.00 foot radius curve to the right whose long chord bears $N21^{\circ}17'46.5''W$, 24.65 feet; thence $N0^{\circ}38'17''E$, 121.56 feet along said East line; thence 25.27 feet along said East line being the arc of a 33.00 foot radius curve to the right whose long chord bears $N22^{\circ}34'21.5''E$, 24.65 feet; thence 7.66 feet along said East line being the arc of a 10.00 foot radius curve to the left whose long chord bears $N22^{\circ}34'21.5''E$, 7.47 feet; thence $N0^{\circ}38'17''E$, 12.27 feet along said East line; thence 6.19 feet along said East line being the arc of a 2.50 foot radius curve to the left whose long chord bears $N70^{\circ}17'54.5''W$, 4.73 feet; thence 44.45 feet along the arc of a 304.50 foot radius curve to the left whose long chord bears $N34^{\circ}35'01''E$, 44.41 feet; thence $S89^{\circ}21'02''E$, 53.68 feet; thence $S0^{\circ}38'17''W$, 106.50 feet along the East right of way of S Wisconsin Street; thence $S89^{\circ}21'43''E$, 3.00 feet along said East right of way; thence $S1^{\circ}02'40''W$, 253.77 feet along said East right of way; thence $N89^{\circ}21'26''W$, 75.20 feet along the North right of way of Lewis Street to the point of beginning.

Road Vacation area contains 28,764 square feet / 0.66 acres more or less.

Part of S Wisconsin Street being located in part of Private Claims 32 and 33, East Side of the Fox River, City of DePere, Brown County, Wisconsin



Drawing No.: L-11240

Publish: October 26, November 2, and November 9, 2020 in the Press Gazette (Class III Notice)

NOTICE OF PUBLIC HEARING

Notice is Hereby given, that on **Tuesday, November 17, 2020** at 7:35 PM or as soon thereafter as can be heard in the Council Chambers of the De Pere City Hall, 335 S. Broadway St, De Pere, WI, a public hearing will be held by the Common Council of the City of De Pere to act on a vacation of a public thoroughfare at the 200 BLK S. Wisconsin Street, adjacent to Parcels ED-812 and ED-920, described as:

Part of S Wisconsin Street being located in part of Private Claims 32 and 33, East Side of the Fox River, City of De Pere, Brown County, Wisconsin, more fully described as follows:

Beginning at the Southeast corner of Lot 1, Volume 54, Certified Survey Maps, Page 312, Map No. 7902, Document No. 2415438, Brown County Records; thence N0°38'17"E, 128.47 feet along the East line of said Lot 1; thence 7.66 feet along said East line being the arc of a 10.00 foot radius curve to the left whose long chord bears N21°17'46.5"W, 7.47 feet; thence 25.27 feet along said East line being the arc of a 33.00 foot radius curve to the right whose long chord bears N21°17'46.5"W, 24.65 feet; thence N0°38'17"E, 121.56 feet along said East line; thence 25.27 feet along said East line being the arc of a 33.00 foot radius curve to the right whose long chord bears N22°34'21.5"E, 24.65 feet; thence 7.66 feet along said East line being the arc of a 10.00 foot radius curve to the left whose long chord bears N22°34'21.5"E, 7.47 feet; thence 0°38'17"E, 12.27 feet along said East line; thence 6.19 feet along said East line being the arc of a 2.50 foot radius curve to the left whose long chord bears N70°17'54.5"W, 4.73 feet; thence 44.45 feet along the arc of a 304.50 foot radius curve to the left whose long chord bears N34°35'01"E, 44.41 feet; thence S89°21'02"E, 53.68 feet; thence S0°38'17"W, 106.50 feet along the East right of way of S Wisconsin Street; thence S89°21'43"E, 3.00 feet along said East right of way; thence S1°02'40"W, 253.77 feet along said East right of way; thence N89°21'26"W, 75.20 feet along the North right of way of Lewis Street to the point of beginning.

Road Vacation area contains 28,764 square feet / 0.66 acres more or less.

A map and detailed description of the proposed right-of-way vacation is available through the City of De Pere Development Services Department at 335 S. Broadway St., De Pere, WI 54115.

Dated this 26th day of October, 2020.

BY ORDER OF THE COMMON COUNCIL

James G. Boyd
Mayor

Carey E. Danen
City Clerk

CITY OF DE PERE MEMO



To: Mayor Boyd and Common Council
 From: Peter Schleinz, Senior Planner | Zoning Administrator
 Date: October 6, 2020
 RE: Street Discontinuance for Wisconsin ST without Charles ST.

Summary

To prepare for the future development of the Mulva Cultural Center near the 200 BLK S. Broadway ST, a proposal was made for the discontinuance (street vacation) of both the 200 BLK S. Wisconsin ST and part of the 500 BLK Charles ST. Plan Commission reviewed the discontinuance of both streets on March 23, 2020 as one project. Shortly after, the proposal was placed on hold to in order to resolve concerns regarding utilities and easements.

The discontinuance for Wisconsin ST is now ready for Common Council review but the discontinuance for Charles ST is not. Thus, the original project has been split into two and Common Council is being asked to consider the discontinuance of Wisconsin ST on October 6, 2020. The discontinuance of Charles ST will occur at a future meeting.

Original March 2020 proposal with both streets:



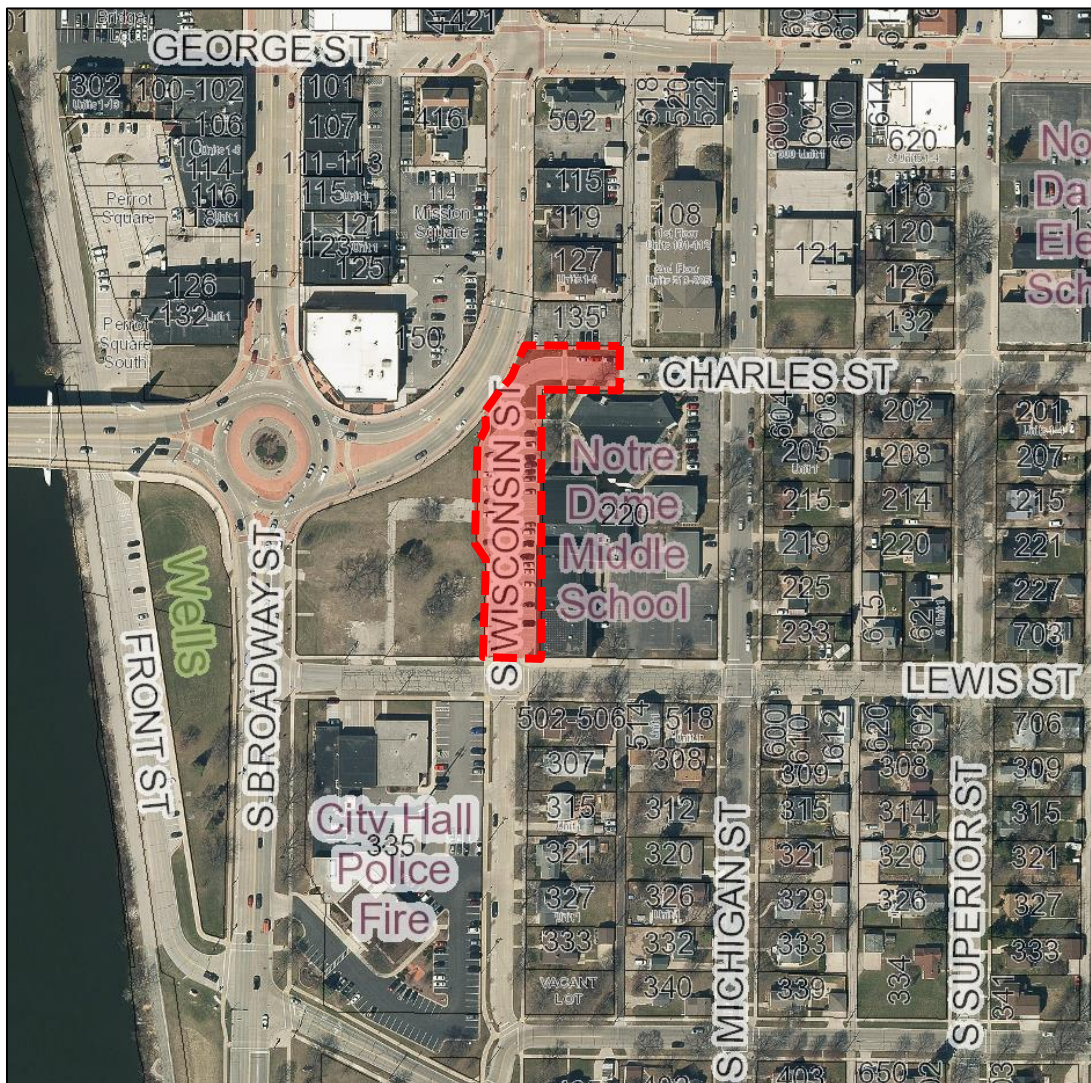
Tonight's proposal with Wisconsin ST only:



- ITEM 10: Staff recommendation and possible action regarding a proposed right-of-way vacation/discontinuance for the 200 BLK of S Wisconsin ST and the west portion of the 500 BLK Charles ST (Adjacent to Parcels ED-812, ED-914, ED-920).

*

PROPOSED RIGHT-OF-WAY VACATION/DISCONTINUANCE



REQUESTED ACTION: Public Right-Of-Way Vacation/Discontinuance Approval.

Right-Of-Way Vacation/Discontinuance for two unnecessary street segments should the Mulva Cultural Center be developed.

COMMON DESCRIPTION: The 200 BLK of S Wisconsin ST and part of the 500 BLK of Charles ST, located north from the Wisconsin ST/Lewis ST intersection and west from the alley and the Charles ST/S Michigan ST intersection.

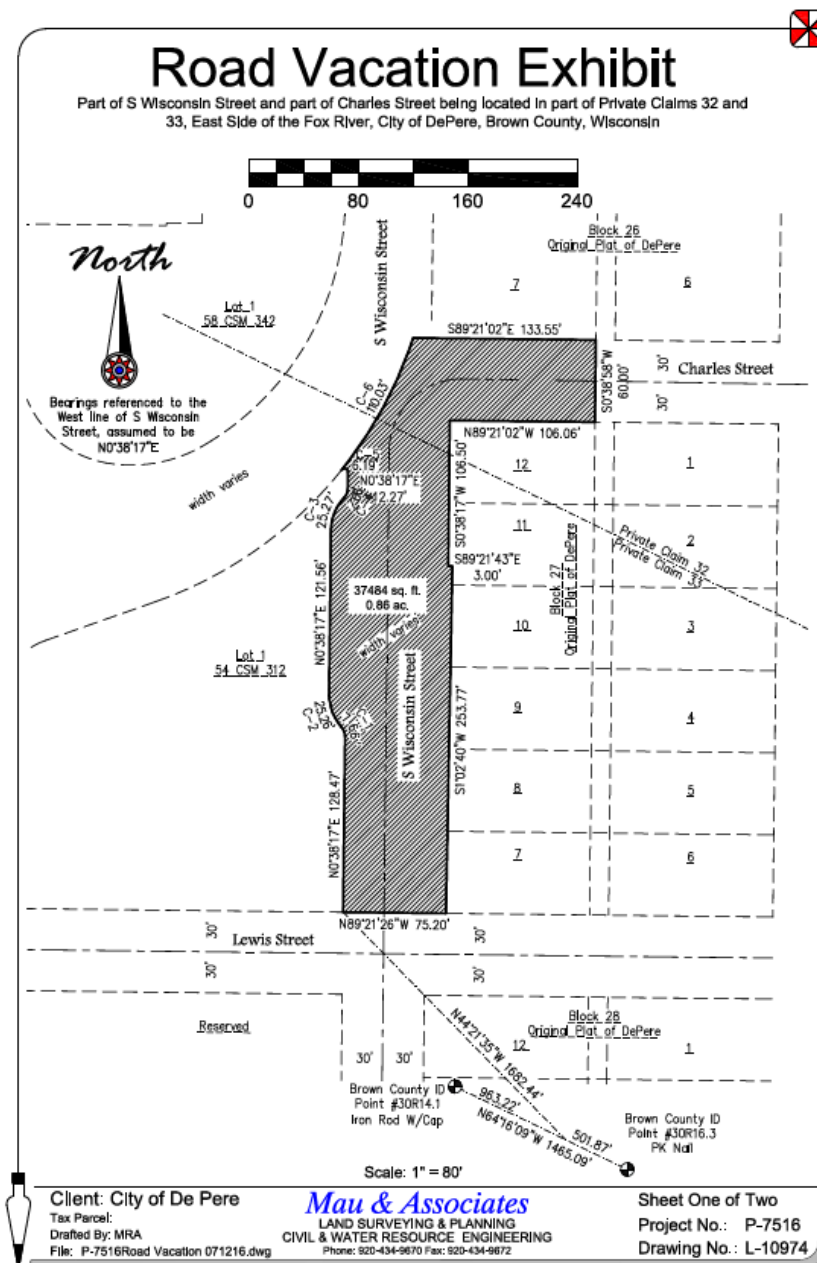
PARCEL NUMBER(S):	Adjacent to Parcels ED-812, ED-914, ED-920	
EXISTING ZONING:	None as the area is existing Right-Of-Way.	
PROPOSED ZONING:	If the vacation is approved by Common Council, and a proposed rezoning for the subject parcels occurs in the near future the vacated right-of-way will take on an R-4 zoning with a PDD overlay.	
SURROUNDING LAND USES:	Uses surrounding the proposed development, not the right-of-way: North (across Wisconsin & Charles) B-1, R-3, R-4 – business, multi-family South (across Lewis) R-2 – Government, single & two-family East (across Michigan) R-2 – single & two-family West (Across Broadway) B-1 – parkland & Fox River	
COMPREHENSIVE PLAN:	Commercial & Institutional/Governmental Facilities	
APPLICANT/OWNER NAME:	Rick Bilotto Authorized Representative De Pere Cultural Foundation INC 231 S Adams ST Green Bay, WI 54301	City of De Pere Public Right-of-way Owner 335 S Broadway ST De Pere, WI 54115
SITE HISTORY:	The proposed site includes parts of two City streets, created from the “Original Plat of De Pere,” that have been in existence since air photos of 1938. The City block to the west of S Wisconsin ST is vacant, and the block to the east has a church, middle school, and parking lot. In the first week of May 2019, the Mulva family announced plans to build an approximate \$50 million cultural center on the site called the “Mulva Cultural Center.” One week later, plans were announced to remove the middle school and the nearby Notre Dame Elementary School, and build a new \$27 million middle/elementary school on the existing elementary school property. Construction of the new off-site school is in progress. In November 2019, St. Francis Xavier Church proposed a land division and site plan for Parcel ED-920 that included the removal of buildings, retaining and expanding the church building, and separating the parking lot. The purpose of the separation of the parking lot was to create a shared parking area with the future cultural center. On January 27, 2020, the De Pere Redevelopment Authority initiated the drafting of agreements to transfer ownership of Parcel ED-812 to the De Pere Cultural Foundation INC for the construction of the Mulva Cultural Center. In February and March 2020, the Mulva Cultural Center Foundation initiated a rezoning and a right-of-way vacation/discontinuance of lands to prepare the area for the Mulva Cultural Center building. This report reflects the vacation/discontinuance only; the rezoning and plan	

development creation will be reviewed by Plan Commission in the coming months.

STAFF REVIEW:

When reviewing a right-of-way vacation/discontinuance, staff utilizes the vacation process identified in Wisconsin State Statutes 66.103 and 66.105. The role of the Plan Commission in the process is to determine if such a vacation/discontinuance is necessary and if so, recommend to the Common Council that the right-of-way be vacated/discontinued. The following are factors for consideration:

- The right-of-way area is adjacent to three parcels of land. The primary use for the streets is access and parking for a middle school that is proposed to be demolished upon the completion of the new school and for parking for a nearby church. Parking accommodations for the church are proposed to be accommodated with a new Church/cultural center.
- The adjacent parcels are proposed for the redevelopment of the vacant sites into the Mulva Cultural Center. The east side of the proposed new building, and parking area, would land within the right-of-way if the right-of-way is not vacated/discontinued.
- The vacation/discontinuance has been reviewed by Development Services and Engineering staff. Conditions of approval were reviewed by Legal staff. If the right-of-way is vacated, the proposed conditions should apply.
 - Create/retain a utility easement for all of Charles Street, but the utilities and easement can be removed for Wisconsin Street.
 - Create an 8-foot snow storage easement at the east end of the vacating Charles Street at the alley.
 - Create a 20-foot walkway easement over the sidewalk on the north side.
 - Relocate the Charles Street sanitary sewer and storm sewer lateral to St Francis Xavier Church. If this property is not going back to St Francis Xavier, they will need rights for their laterals in these areas.
 - If the right-of-way is vacated/discontinued the land should legally be attached to Parcels ED-812, ED-914 and ED-920.



Typically, when a right-of-way is vacated/discontinued, the land is divided in half and attached to each adjacent property owner. However; when all of the land was originally dedicated by an owner on one side of the right-of-way to create the street, all of the rights-of-way then is attached back to the original land that dedicated the right-of-way. Brown County Property Listing has indicated that S Wisconsin ST and Charles ST likely will be divided in half, with all of the parking area of the right-of-way on S Wisconsin ST going to the west.

All immediately adjacent property owners have been notified of the right-of-way vacation/discontinuance petition. No comments have been received as of March 17, 2020.

If an adjacent property owner did object to a proposed vacation, then the need for a simple majority vote of approval from the Common Council changes to the need for a 2/3 vote (6 out of 8 Council members must vote in favor, not just 2/3 of Council members in attendance when voting).

Any property owner comments received after March 17, 2020, will be provided to the Plan Commission at the meeting on March 23, 2020.

REVIEW PROCESS:

The Common Council will review the Plan Commission recommendation twice, first as a resolution on April 8, 2020 and then with a public hearing and resolution potentially on May 19, 2020.

Immediately adjacent property owners were notified of all proposed meetings. The review process follows State Statute requirements and there is not a 300-foot nearby neighbor notification requirement.

STAFF RECOMMENDATION:

Staff recommends APPROVAL and forwarding the right-of-way vacation to the Common Council for final approval with the following conditions:

1. Create/retain A utility easement over all of Charles Street from the alley to Wisconsin Street. No permanent structures will be allowed in this area.
2. Any utilities within Wisconsin Street are properly relocated to allow easements within the right-of-way to be released.
3. Create an 8-foot snow storage easement at the east end of the vacating Charles Street at the alley.
4. Create a 20-foot walkway easement over the sidewalk on the north side.
5. Relocate the Charles Street sanitary sewer and storm sewer lateral to St Francis Xavier Church. If this property is not going back to St Francis Xavier, they will need rights for their laterals in these areas.

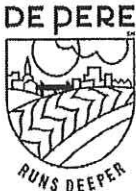
LEGAL DESCRIPTION

Part of S Wisconsin Street and part of Charles Street being located in part of Private Claims 32 and 33, East Side of the Fox River, City of De Pere, Brown County, Wisconsin, more fully described as follows:

Beginning at the Southeast corner of Lot 1, Volume 54, Certified Survey Maps, Page 312, Map No. 7902, Document No. 2415438, Brown County Records; thence N0°38'17"E, 128.47 feet along the East line of said Lot 1; thence 7.66 feet along said East line being the arc of a 10.00 foot radius curve to the left whose long chord bears N211°46.5"W, 7.47 feet; thence 25.27 feet along said East line being the arc of a 33.00 foot radius curve to the right whose long chord bears N21°17'46.5"W, 24.65 feet; thence

N0'38'17"W, 121.56 feet along said East line; thence 25.27 feet along said East line being the arc of a 33.00 foot radius curve to the right whose long chord bears N22'34'21.5"E, 24.65 feet; thence 7.66 feet along said East line being the arc of a 10.00 foot radius curve to the left whose long chord bears N22'34'21.5"E, 7.47 feet; thence NO'38'17"W, 12.27 feet along said East line; thence 6.19 feet along said East line being the arc of a 2.50 foot radius curve to the left whose long chord bears N70'17'54.5"W, 4.73 feet; thence 110.03 feet along the arc of a 304.50 foot radius curve to the left whose long chord bears N28'24'48"E, 109.43 feet; thence S89'21'02"E, 133.55 feet along the North right of way and it's extension of Charles Street; thence SO*38'58"W, 60.00 feet to the South right of way of said Charles Street; thence N89'21'02"W, 106.06 feet along said South right of way; thence SO'38'17"W, 106.50 feet along the East right of way of S Wisconsin Street; thence S89'21'43"E, 3.00 feet along said East right of way; thence S1'02'40"W, 253.77 feet along said East right of way, thence N89'21'26"W, 75.20 feet along the North right of way of Lewis Street to the point of beginning.

Road Vacation area contains 37,484 square feet / 0.86 acres more or less.

	CITY OF DE PERE APPLICATION FOR ROW VACATION	Fee: \$ 305.00 Receipt #: _____ Date: _____
---	---	--

Read all instructions provided before completing. If additional space is needed, attach additional pages. Type or use black ink.

SECTION 1: Applicant / Permittee Information

Applicant Name (Ind., Org. or Entity) De Pere Cultural Foundation, Inc.	Authorized Representative Rick Bilotto	Title Owner's Representative	
Mailing Address 231 S. Adams Street	City Green Bay	State WI	ZIP Code 54301
Email Address rick@theprgteam.com	Phone Number (incl. area code) 920-366-3783	Fax Number (incl. area code)	

SECTION 2: Landowner Information (complete these fields when project site owner is different than applicant)

Name (Ind. Org. or Entity) City of De Pere	Contact Person Peter Schleinz	Title Senior Planner	
Mailing Address 335 S. Broadway	City De Pere	State WI	ZIP Code 54115
Email Address pschleinz@mail.de-pere.org	Phone Number (incl. area code) 920-339-4043	Fax Number (incl. area code)	

SECTION 3: Right of Way Requested to be Vacated

Name of ROW: Legal Description to be Vacated: (Please attach map)	Right of way vacation of sections of Wisconsin St and Charles St
--	--

SECTION 4: Reason of Vacation

Reason for Requesting Vacation of ROW:	For use for the Mulva Cultural Center development
--	---

SECTION 5: Certification and Permission

Certification: I hereby certify that I am the owner or authorized representative for this Application. I certify that the information contained in this form and attachments is true and accurate.

Name of Owner/Authorized Representative (please print) Rick Bilotto	Title Owner's Representative	Phone Number 920-366-3783
Signature of Applicant <i>Rick Bilotto</i>		Date Signed March 6, 2020



Road Vacation Exhibit

Part of S Wisconsin Street being located in part of Private Claims 32 and 33, East Side of the Fox River, City of DePere, Brown County, Wisconsin



North



Bearings referenced to the West line of S Wisconsin Street, assumed to be $N0^{\circ}38'17''E$

width varies

Lot 1
58 CSM 342

S Wisconsin Street

Block 26
Original Plat of DePere

Charles Street

$N0^{\circ}38'17''E$
12.27'

$S89^{\circ}21'02''E$ 53.68'

$S0^{\circ}38'17''W$ 106.50'

$S89^{\circ}21'43''E$ 3.00'

$N0^{\circ}38'17''E$ 121.56'

$N0^{\circ}38'17''E$ 128.47'

$N89^{\circ}21'26''W$ 75.20'

$N44^{\circ}21'35''W$ 1682.44'

$N64^{\circ}16'09''W$ 1465.09'

$501.87'$

$963.22'$

$501.87'$

$963.22'$

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$963.22'$

$501.87'$

Lot 1
54 CSM 312

28764 sq. ft.
0.66 ac.

S Wisconsin Street

Block 27
Original Plat of DePere

Private Claim 32
Private Claim 33

Lewis Street

Reserved

Brown County ID
Point #30R14.1
Iron Rod W/Cap

Brown County ID
Point #30R16.3
PK Nail

Scale: 1" = 80'

Client: City of De Pere

Tax Parcel:

Drafted By: MRA

File: P-7516Road Vacation S Wiscon.dwg

Mau & Associates

LAND SURVEYING & PLANNING
CIVIL & WATER RESOURCE ENGINEERING
Phone: 920-434-9670 Fax: 920-434-9672

Sheet One of Two

Project No.: P-7516

Drawing No.: L-11240



LEGAL DESCRIPTION OF ROAD TO BE VACATED

Part of S Wisconsin Street being located in part of Private Claims 32 and 33, East Side of the Fox River, City of DePere, Brown County, Wisconsin, more fully described as follows:

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Road Vacation area contains 28,764 square feet / 0.66 acres more or less.

Curve Data

CURVE	ARC LENGTH	RADIUS	CHORD LENGTH	CHORD BEARING	CENTRAL ANGLE	TANGENT BEARING
C-1	7.66	10.00	7.47	N21°17'46.5"W	43°52'07"	S43°13'50"E
C-2	25.27	33.00	24.65	N21°17'46.5"W	43°52'07"	S43°13'50"E
C-3	25.27	33.00	24.65	N22°34'21.5"E	43°52'07"	N44°30'25"E
C-4	7.66	10.00	7.47	N22°34'21.5"E	43°52'07"	N44°30'25"E
C-5	6.19	2.50	4.73	N70°17'54.5"W	141°52'23"	S38°45'54"W
C-6	44.45	304.50	44.41	N34°35'01"E	8°21'49"	S38°45'55.5"W





City of De Pere, Wisconsin

Request For Common Council Action

MEETING DATE: November 17, 2020

DEPARTMENT: City Attorney

FROM: Angela Zills

SUBJECT: Proclamation in Appreciation and Gratitude to Poll Workers and Staff for Service During the November General Election.

ATTACHMENTS:

- Proclamation_Nov Election (PDF)

PROCLAMATION

IN APPRECIATION AND GRATITUDE TO POLL WORKERS & STAFF FOR SERVICE DURING THE NOVEMBER 2020 GENERAL ELECTION

***WHEREAS**, voting is a precious American principal; a basic democratic right for our people, which should be protected, promoted and practiced; and*

***WHEREAS**, on our most recent election day of November 3, 2020, the ongoing COVID-19 pandemic created unprecedented adverse health, planning and logistical conditions for this democratic process, and*

***WHEREAS**, regardless of this multitude of adversities, many in the City of De Pere still nobly offered to serve our residents on election day and uphold this foundational democratic institution for our community; and*

***WHEREAS**, our City's poll workers featured 39 experienced workers, 73 citizens who volunteered to step in (including both a current and a former alderperson), in addition to a group of St. Norbert College students who performed over 100 hours of service - all coming together to help serve this community in uncertain times; and*

***WHEREAS**, staff in our City Clerk's office, as well as additional staff from other City departments, provided commendable, tireless and flexible service to our community during a time of complex, continuous changes processing over ; and*

***WHEREAS**, guidance from our De Pere Health Department also helped ensure the safest possible set-up during this election under the parameters and circumstances available to our community; and*

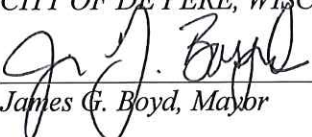
***WHEREAS**, despite the challenges surrounding this election, the City experienced a positive voter-turnout of 87% (14,428), with an unprecedented level of absentee voting (over 10,000); and*

***WHEREAS**, our City is truly grateful for each of these individuals who served as poll workers or helped oversee the election process. As our community and country endure the difficult, challenging realities of this pandemic, the efforts of these individuals were noble and selfless, and have not gone unnoticed.*

***NOW, THEREFORE**, I, James Boyd, Mayor of the City of De Pere, Wisconsin, on behalf of the De Pere Common Council and all De Pere citizens, do hereby offer our highest gratitude to the many poll workers, volunteers and staff that helped uphold our democratic process during unprecedented conditions.*

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the Seal of the City of De Pere, Wisconsin, this 17th day of November, 2020.

CITY OF DE PERE, WISCONSIN


James G. Boyd, Mayor



City of De Pere, Wisconsin

Request For Common Council Action

MEETING DATE: November 17, 2020

DEPARTMENT: Fire Department

FROM: Lea Taylor

SUBJECT: Recommendation from Finance/Personnel Committee to accept donation of two ice dispensing machines from Humana for the Fire Dept.

Unanimously approved.

ATTACHMENTS:

- FIRE DEPT ICE DISPENSING MACHINEDONATION REQUEST (PDF)

Memo



To: Honorable Mayor James Boyd
Members of the Finance & Personnel Committee

From: Alan Matzke, Fire Chief *A.M.*

Date: November 3, 2020

Re: Consider Donation of Two Ice Dispensing Machines from Humana

Humana, located at 1100 Employers Boulevard in De Pere, has offered the Fire Department two new ice dispensing machines. These two machines were ordered three years ago, but never used. The ice machines are "Follett – Symphony Plus Series," with a retail value of \$4,000 each. Our intention is to install one at each of our fire stations.

The Humana Maintenance Director, Mr. Chris Ristow, has been our contact for this project. If authorized to accept these ice machines, Fire Department Personnel will work with a local plumber to complete the installation of both machines (one at each fire station) at minimal cost to the City.

Thank you for your consideration of this request. We respectfully ask for your support to move this item forward to the City's Common Council for final action and acceptance. If you have any questions, please do not hesitate to ask.



City of De Pere, Wisconsin

Request For Common Council Action

MEETING DATE: November 17, 2020

DEPARTMENT: City Clerk

FROM: Ann Ledvina

SUBJECT: Recommendation from the License Committee on a request by Dylan Doxtater-Gillis to appear before the License Committee regarding denial of his Operator License Application.

This application was denied on 10/22/2020 by the City Clerk.

**City of De Pere, Wisconsin****Request For Common Council Action**

MEETING DATE: November 17, 2020

DEPARTMENT: City Clerk

FROM: Ann Ledvina

SUBJECT: **Recommendation from the License Committee on a request by the Chief of Police to conduct a pre-hearing on the Class B Combination Liquor License issued to Crystal Jenss (DBA On The Rocks Bar) 413 Main Ave. based upon allegations of liquor license regulation violations.**

The department has received multiple complaints regarding the bar On the Rocks (413 Main Ave.). The complaints were regarding On The Rocks allowing people under the age of 21 inside and consuming alcohol. On 10-30-2020, a compliance check was performed at the bar. Through the investigation, 51 underage individuals were located inside the bar. Only two individuals out of 51 were found to have been in possession of false identification. All but one of the 51 cited individuals were under the influence with most over the legal driving limits if they were 21 years of age. Two individuals had high concentrations of alcohol in their blood that resulted in .211 and .216% reading on the preliminary breath tests. The owner of the bar, Crystal Jenss, was the bartender at the time of this incident. The liquor license for this location was issued to Crystal Jenss as an individual and she is listed as the manager on the liquor license application. Crystal Jenss received 51 citations for allowing an underage person on a licensed premise in violation of Sec. 7.125.07 of the De Pere Municipal Code.

ATTACHMENTS:

- License Committee - Prehearing on Liquor License (PDF)

MEMORANDUM

TO: License Committee Members
Common Council Members

FROM: Kristen Johnson, Assistant City Attorney

DATE: November 17, 2020 (meeting date)

RE: Conduct of Liquor License Prehearing Upon Allegation of Regulation Violations

The purpose of this memo is to provide the License Committee with information regarding the procedure for a liquor license prehearing upon allegation of regulation violations under § 7-13(d) De Pere Municipal Code.

A hearing is necessary before a liquor license can be suspended or revoked under constitutional requirements of due process: governmental entities may not deprive persons of property without due process of law. Due process has two components; providing notice of the reasons or basis of the action being taken and providing an opportunity to object to those reasons and the action being taken.

Under § 7-13 DPMC, the City has established a process by which a liquor license may be suspended or revoked. A state or city agency may submit to the city clerk a written request for a prehearing before the License Committee alleging a violation of state liquor laws or any violation listed in § 7-13 DPMC. The code specifies that the conduct of the prehearing shall be informal, allowing the Committee an opportunity to hear general allegations and permitting the accused licensee to respond. The code also identifies the purpose of the prehearing, which is to determine if the allegations are of sufficient magnitude, importance or otherwise of such a nature as to require a formal evidentiary hearing before the Common Council.

At the prehearing, the Police Department will present information to the Committee regarding the alleged violations. The Committee must give the licensee an opportunity to respond, but the licensee is not required to do so. It is important to note that the prehearing allows the Committee to hear only general allegations of violations. This is to ensure that members of the Committee remain unbiased. In the event a formal evidentiary hearing is held before the Council, it is important that all members of the Council remain impartial. If the Committee receives information that results in a member or members prejudging the matter, that member or members should recuse themselves from acting as part of the hearing body. Details of specific violations are to be presented at a formal evidentiary hearing for the Council to consider in rendering its decision. Ensuring due process will make it less likely that the action will be overturned on appeal. Everyone has an interest in making sure there is finality to the Council's decision.

After receiving information from the Police Department and allowing the licensee an opportunity to respond, the Committee shall determine how to proceed. The municipal code identifies three potential actions the Committee may take:

1. To issue a letter of warning to the licensee to become part of the licensee's permanent file;
2. No action be taken; or
3. To recommend to the Common Council that a formal evidentiary hearing be held.

In determining the appropriate course of action, the Committee shall consider:

1. The licensee's history of convictions, charges or complaints, and the relationship of such history to the licensed activities.
2. The length of time since such conviction, charge or complaint.
3. The circumstances and seriousness surrounding the complaints before the Committee.
4. The degree of personal rehabilitation since the last incident involving the licensee.
5. The community standards or interests to be protected.
6. The need for a formal hearing to clarify the facts in regard to the complaint before the Committee.

The recommendation of the Committee will go to Council on November 17, 2020. If a formal evidentiary hearing is recommended and the Council approves the recommendation, a formal evidentiary hearing will be scheduled for a future date. This will allow the City Attorney's Office an opportunity to ensure that a formal complaint is filed and served upon the licensee pursuant to Wis. Stat. § 125.12.

I will attend the License Committee meeting on November 17, 2020, in order to advise the Committee as it holds this prehearing. If you have any questions or concerns ahead of the meeting, please call me at 339-4070 or email me at kkjohnson@deperewig.gov to discuss.

KKJ

**City of De Pere, Wisconsin****Request For Common Council Action**

MEETING DATE: November 17, 2020

DEPARTMENT: Board of Public Works

FROM: Scott Thoresen

SUBJECT: Ordinance #20-20 Amending Chapter 150 De Pere Municipal Code Regarding Traffic Regulations (Schedule G. Parking and Schedule C. Yield Right-of-Way Intersections).

The Board of Public Works at the November 9, 2020 meeting approved ordinance changes to include parking restrictions in the new Pine Trail Crossing Subdivision and Garrity's Glen Subdivision, changes to parking restrictions on Lewis Street due to Notre Dame School relocation, and installing "No Outlet" sign on Butler Street west of S. Sixth Street and moved to send it to Common Council for approval. The motion passed with a 5-0 vote.

The Board of Public Works at the November 9, 2020 meeting approved ordinance changes to include installing yield signs on Nicolet Avenue at White Pine Avenue and moved to send it to Common Council for approval. The motion passed with a 3-2 vote.

ATTACHMENTS:

- Ord20-20 (PDF)
- 2020 1109-CI-BOPW-PTTeam-Recommendations (PDF)

ORDINANCE #20-20

AMENDING CHAPTER 150 DE PERE MUNICIPAL CODE REGARDING TRAFFIC REGULATIONS
(Schedule G. Parking and Schedule C. Yield Right-of-Way Intersections)

THE COMMON COUNCIL OF THE CITY OF DE PERE DO ORDAIN AS FOLLOWS:

Section 1: Section 150-23, Schedule G (PARKING), is hereby amended as follows:**A. ADDITIONS:**

NO PARKING			
<i>Street</i>	<i>Side of Street</i>	<i>From Curbline or Feet/Dir. Of Curbline</i>	<i>To Curbline or Feet/Dir. of Start</i>
Scarlet Oak Circle	Inside Loop	Diversity Drive	Diversity Drive
Scarlet Oak Road	E	530' S/O Diversity Drive	Diversity Drive
Diversity Drive	S	Scarlet Oak Road	Ryan Road
Ballyvaughan Road	E	250' S/O Garroman Drive	205' S/O Adare Court
Garroman Drive	N	Lawrence Drive	Ballyvaughan Road
Garroman Drive	S	Ballyvaughan Road	530' E/O Ballyvaughan Road
Kilrush Road	E & N	550' S/O County Claire Road	Ballyvaughan Road
Tipperary Trail	S & W	Ballyvaughan Road	Garroman Road

B. DELETIONS:

<i>No stopping or standing during school hours 7:30 a.m. to 3:30 p.m.</i>			
<i>Street</i>	<i>Side of Street</i>	<i>From Curbline or Feet/Dir. Of Curbline</i>	<i>To Curbline or Feet/Dir. of Start</i>
Lewis Street	S	Wisconsin Street	Michigan Street

<i>Buses only during school hours</i>			
<i>Street</i>	<i>Side of Street</i>	<i>From Curbline or Feet/Dir. Of Curbline</i>	<i>To Curbline or Feet/Dir. of Start</i>
Lewis Street	N	Wisconsin Street	Michigan Street

Section 2: Section 150-23, Schedule C (YIELD RIGHT-OF-WAY INTERSECTIONS), is hereby amended by making the following addition:

<i>Traffic On</i>	<i>Yields At</i>
Nicolet Avenue	White Pine Avenue

Ordinance #20-20
Page 2 of 2

Section 3: All ordinances or parts of ordinances in conflict herewith are hereby repealed.

Section 4: This ordinance shall take effect on and after its passage and publication.

Adopted by the Common Council of the City of De Pere, Wisconsin, this 17th day of November, 2020.

APPROVED:

James G. Boyd, Mayor

ATTEST:

Carey E. Danen, City Clerk

Ayes: _____

Nays: _____

Board/Committee Approval: 11/09/2020

Publication Date: _____

Effective Date: _____

CITY OF DE PERE

Public Works Department

925 S. Sixth Street, De Pere, WI 54115 | 920-339-4060 | www.de-pere.org



City Engineer Parking and Traffic Recommendations October 23, 2020 Meeting

Parking and Parking Lot Items:

- Review parking restrictions for the Pine Trail Crossing Subdivision.
 - The subdivision was built for parking on one side only.*

Recommendation:

Staff recommends the Ordinance be updated as follows:

Insert the following:

NO PARKING			
Street	Side of Street	From Curbline or Feet/Dir. of Curbline	To Curbline or Feet/Dir. of Start
Scarlet Oak Circle	Inside Loop	Diversity Drive	Diversity Drive
Scarlet Oak Road	E	530' S/O Diversity Drive	Diversity Drive
Diversity Drive	S	Scarlet Oak Road	Ryan Road

- Review parking restrictions for the Garrity's Glen Subdivision.
 - The subdivision was built for parking on one side only.*

Recommendation:

Staff recommends the Ordinance be updated as follows:

Insert the following:

NO PARKING			
Street	Side of Street	From Curbline or Feet/Dir. of Curbline	To Curbline or Feet/Dir. of Start
Ballyvaughan Road	E	250' S/O Garroman Drive	205' S/O Adare Court
Garroman Drive	N	Lawrence Drive	Ballyvaughan Road

<i>Garroman Drive</i>	<i>S</i>	<i>Ballyvaughan Road</i>	<i>530' E/O Ballyvaughan Road</i>
<i>Kilrush Road</i>	<i>E & N</i>	<i>550' S/O County Claire Road</i>	<i>Ballyvaughan Road</i>
<i>Tipperary Trail</i>	<i>S & W</i>	<i>Ballyvaughan Road</i>	<i>Garroman Road</i>

3. Lewis Street parking changes due to Notre Dame School relocation
 - a. No stopping or standing during school hours 7:30 a.m. to 3:30 p.m.
 - i. South Side – Wisconsin to Michigan
 - b. Buses only during school hours
 - i. North Side – Wisconsin to Michigan
 - *Notre Dame Middle School has been relocated to 137 S. Superior Street*

Recommendation:

Staff recommends the Ordinance to be updated to eliminate school related parking restrictions on Lewis Street as follows:

Delete the following:

<i>No stopping or standing during school hours 7:30 a.m. to 3:30 p.m.</i>			
<i>Street</i>	<i>Side of Street</i>	<i>From Curbline or Feet/Dir. of Curbline</i>	<i>To Curbline or Feet/Dir. of Start</i>
<i>Lewis Street</i>	<i>S</i>	<i>Wisconsin Street</i>	<i>Michigan Street</i>

Delete the following:

<i>Buses only during school hours</i>			
<i>Street</i>	<i>Side of Street</i>	<i>From Curbline or Feet/Dir. of Curbline</i>	<i>To Curbline or Feet/Dir. of Start</i>
<i>Lewis Street</i>	<i>N</i>	<i>Wisconsin Street</i>	<i>Michigan Street</i>

Signs – Other

4. Consider Yield Signs at multiple locations on the northeast side of the City due to visibility and road layout
 - *This item is part of a multiple intersection request. The request shows up under the Action and Discussion items.*

- *Each of the streets below is a local residential street with low traffic volume. Staff reviewed the locations for visibility and other field conditions. Photos at the intersections have been provided.*

Location:

- a. Nicolet at White Pine



East Bound – Nicolet at White Pine



Eastbound – Left at Nicolet at White Pine



Eastbound – Right at Hickory at White Pine



Westbound Nicolet at White Pine



Westbound – Left at Nicolet at White Pine



Westbound – Right at Nicolet at White Pine

Recommendation:

Staff recommends the Ordinance be updated to place yield signs at this location due to site visibility and intersection alignment. The Ordinance would be updated as follows:

Insert the following:

YIELD RIGHT-OF-WAY INTERSECTIONS

<i>Traffic On</i>	<i>Yields At</i>
<i>Nicolet Avenue</i>	<i>White Pine Avenue</i>

5. Consider No Outlet sign at Butler (West)

Butler and Martin are both dead end streets. The total distance to the end of Martin Street from Sixth Street is 900 feet. It is not apparent that these streets do not have an outlet. This location meets the City policy for installing a 'No Outlet' sign which is as follows:

- *The street cannot have an exit.*
- *The distance from the outlet intersection to the end of the farthest street must be at least 400 feet.*
- *The end of the farthest street is not visible from the outlet intersection.*

Recommendation:

Staff recommends the installation of a "No Outlet" sign on Butler (W) at Sixth Street.

Other

6. Consider a street light at the driveway for 2198 CTH PP.

This section of CTH PP is a rural roadway with gravel shoulders and ditch. There are condominiums on the west side in the City and farm field on the east side. The nearest lights are 1000 feet to the south at Diversity Drive and 700 feet to the north at Killarny Trail.

Recommendation:

Staff recommends installing the street light. If approved by the Board, staff will coordinate the installation with Brown County.



City of De Pere, Wisconsin

Request For Common Council Action

MEETING DATE: November 17, 2020

DEPARTMENT: Board of Public Works

FROM: Scott Thoresen

SUBJECT: Ordinance #20-21 Creating Chapter 23 De Pere Municipal Code Regulating the Application and Sale of Coal Tar and Other High-PAH Sealant Products.

The Board of Public Works at the March 9, 2020 meeting approved amending the City of De Pere Municipal Code regarding the prohibition of coal-tar and other PAH containing sealants effective January 1, 2021 and moved to send it to the Common Council for approval. The motion passed with a 5-0 vote.

ATTACHMENTS:

- Ord20-21 (DOCX)
- 2020 0309 PAH Memo (PDF)
- FAQ Memo_FWWA_NEWSC (PDF)
- Enforcement Memo_FWWA_NEWSC(PDF)
- Clean Wisconsin FACT SHEET - Tar-Based Sealants (revised_1-10-2018) (PDF)
- LakeLinePAHSealcoatSummary (PDF)
- Mahler et al. 2012_ summary of PAHs and CTS (PDF)
- Local PAH Levels (PDF)

ORDINANCE #20-21

CREATING CHAPTER 23 DE PERE MUNICIPAL CODE REGULATING THE APPLICATION
AND SALE OF COAL TAR AND OTHER HIGH-PAH SEALANT PRODUCTS

WHEREAS, the Common Council finds that the City's natural water resources enhance environmental, recreational, cultural and economic assets and opportunities in the City and contribute to the general health, safety and welfare of the public; and

WHEREAS, the Common Council further finds that polycyclic aromatic hydrocarbons (PAHs), which are found in coal tar sealants and other high-PAH sealants, volatilize off sealed pavement and can be inhaled by humans and animals; sealed surfaces are eroded by weathering, foot and vehicle traffic, and snow plowing, creating PAH-contaminated particles that are easily transported into homes and onto nearby soils and can be carried by storm water and other run off into the water resources of City of De Pere, increasing the cost of storm water pond sediment removal and disposal; and

WHEREAS, PAHs are an environmental concern because they are toxic to aquatic life, causing deformities and other reproductive and developmental problems, cancer, and death that results in a loss of species and fewer organisms; and

WHEREAS, PAH compounds have been proven to cause cancer, mutations, and birth defects in humans according to the International Agency for Research on Cancer and the American Medical Association advocates for legislation to regulate the use of pavement sealants containing PAHs ; and

WHEREAS, adverse environmental impacts and human health risks can be minimized and pavements can be maintained by utilizing alternative products or methods, absent PAHs; and

WHEREAS, the Common Council finds that regulating PAHs contained in coal tar sealant products and other high-PAH sealant products will protect water resources and will improve and protect the public health and natural water resources of City of De Pere.

NOW THEREFORE, THE COMMON COUNCIL OF THE CITY OF DE PERE DO ORDAIN AS

FOLLOWS:

Section 1: Chapter 23 Coal Tar Sealant Products is hereby created to read:

23-1. - DEFINITIONS.

- (a) *Coal Tar* is a byproduct of the process used to refine coal. Coal tar contains high levels of polycyclic aromatic hydrocarbons (PAHs).
- (b) *Coal Tar Sealant Product* means a pavement sealant product that contains coal tar, coal tar pitch, coal tar pitch volatiles, RT-12, Refined Tar or any variation assigned the Chemical Abstracts Service (CAS) numbers 65996-92-1, 65996-93-2, 65996-89-6, or 8007-45-2 or related substances.
- (c) *High-PAH Sealant Product* means any pavement sealant product that contains greater than 0.1% polycyclic aromatic hydrocarbons (PAHs) by weight, including, but not limited to, coal tar sealant products and sealant products containing steam-cracked petroleum residues, steam-cracked asphalt, pyrolysis fuel oil, heavy fuel oil, ethylene tar, or any variation of those substances assigned the chemical abstracts service number 64742-90-1, 69013-21-4 or related substances.
- (d) *Pavement Sealant Product* or sealcoat, is any substance that is typically applied on paved surfaces to protect the surfaces. This may include but is not limited to sealant products that are coal tar or asphalt based.
- (e) *Polycyclic Aromatic Hydrocarbons (PAHs)* means a group of organic chemicals that are formed during the incomplete combustion of coal, oil, gas, or other organic substances, are present at high levels in coal tar, and are known to be harmful to humans, fish, and other aquatic life.
- (f) *Director* means the Director of Public Works or his or her designee.

23-2. - REGULATION OF THE APPLICATION AND SALE OF COAL TAR OR OTHER HIGH PAH SEALANT PRODUCTS.

- (a) No person shall apply any coal tar sealant product or high PAH sealant product within City of De Pere.
- (b) No person shall sell, offer to sell, or display for sale any coal tar sealant product or high PAH sealant product within City of De Pere.
- (c) No person shall allow a coal tar sealant product or other high-PAH sealant product to be applied upon property in the City that is under that person's ownership or control.

Ordinance #20-21

Page 3 of 4

(d) No person shall contract with any commercial applicator, residential or commercial developer, or any other person for the application of any coal tar sealant product or high PAH sealant product to any driveway, parking lot, or other surface within the City.

(e) No commercial applicator, residential or commercial developer, or other similar individual or organization shall direct any employee, independent contractor, volunteer, or other person to apply any coal tar sealant product or high PAH sealant product to any driveway, parking lot, or other surface within the City.

23-3. – EXEMPTIONS.

- (a) The Director may exempt a person from the requirements of section 23-2 if the person is conducting bona fide research concerning the effects of a coal tar sealant product or high PAH sealant product on the environment; the use of the coal tar product or high PAH sealant product is required for said research; and the Director determines that said research will not cause significant contamination of the surrounding environment, including soils and aquatic ecosystems, and will not unduly endanger human health.
- (b) The Director of Public Works may exempt a person or commercial applicator from the requirements of section 23-2 if the person/applicator does not intend to and does not apply the sealant within the City. In addition to the imposition of any other penalties under this chapter, any exemption granted under this paragraph shall terminate upon use of the sealant in the City.

23-4. - ENFORCEMENT AND PENALTIES.

- (a) Any person or entity that violates any provisions of section 23-2 by applying a coal tar sealant product or high PAH sealant product at his or her residence may be subjected to forfeiture as determined by resolution of the Common Council. Each day that application is made shall constitute a separate offense.

23-5. - SEVERABILITY.

If any section, paragraph, subdivision, clause, sentence or provision of this Ordinance is determined by any Court of competent jurisdiction to be invalid or unenforceable, such judgment shall not affect, impair, invalidate or nullify the remainder thereof, which remainder shall remain and continue in full force and effect.

Section 2: All ordinances or parts of ordinances in conflict herewith are hereby

repealed to the extent of such conflict.

Ordinance #20-21
Page 4 of 4

Section 3: This ordinance shall take effect on January 1, 2021.

Adopted by the Common Council of the City of De Pere, Wisconsin, this 17th day of November,
2020.

APPROVED:

James G. Boyd, Mayor

ATTEST:

Carey E. Danen, City Clerk

Ayes: _____

Nays: _____

Board/Committee Approval: 6/11/2019

Publication Date: _____

Effective Date: 01/01/2021

CITY OF DE PERE MEMO



To: Honorable Mayor Walsh
Members of the Board of Public Works

From: Eric P. Rakers, P.E., City Engineer

Date: March 9, 2020

RE: **Consideration and Possible Action on the Prohibition of Coal-Tar and other PAH Containing Pavement Sealants***

Pavement sealants which are also known as sealcoats or sealers are the jet-black coatings homeowners and contractors apply to residential, commercial, and industrial driveways or parking lots. A variety of pavement sealants contain polycyclic aromatic hydrocarbons (PAHs), which are toxic compounds that can cause cancer and developmental problems in children. The coal tar-based sealants contain the highest levels of PAHs, while others contain lower amounts or zero PAHs. Clean Wisconsin and other agencies are partnering to provide Clean Wisconsin with a platform to further grassroots effort on banning the use of sealants containing 0.1% PAH or greater in Northeast Wisconsin. The goal of these efforts is to create enough public support to regulate the use of these products. The way municipalities can regulate this is to create an ordinance to prohibit the use of these types of sealants. PAH's impact the City in many indirect ways, but one direct way is with our storm water ponds. If sediment in the ponds have high PAH levels, the sediment cost for disposal will increase as this material will need to be hauled to a landfill. Information has been attached as follows:

- Clean Wisconsin Memo to NEWSC – Public Health Danger and Local Solutions to Coal Tar-Based Pavement Sealant Toxicity.
- Clean Wisconsin Memo to NEWSC – Summary of Sealant Ban Elsewhere
- Clean Wisconsin Article
- Lake Line Publication – PAHs in Lakes
- Environmental Science & Technology – Coal-Tar-Based Pavement Sealcoat and PAHs
- City of De Pere – Online Retailer Sealant Review

A draft ordinance was presented to the Sustainability Commission in June 2019 and approved. The ordinance was mistakenly described as a prohibition of only coal tar-based sealants. Upon further inspection of the banning efforts by Clean Wisconsin, it was discovered to include all sealants containing 0.1% PAH or greater. Staff reached out to Asphalt Seal & Repair, a local company that performs work in the City of De Pere, for information on their product and the proposed PAH ban limit. According to Asphalt Seal & Repair, the product they use contains 0.2% PAH but has a longer life. Staff reached out to Clean Wisconsin for justification of the 0.1% limit and also to Asphalt Seal & Repair for the longevity of their product. Staff did not receive sufficient evidence to justify 0.1% or a longer life at 0.2% PAH. Staff checked with local retailers and found most only provide products under the 0.1% threshold.

A draft ordinance has been attached. A few items on the ordinance:

- The City Attorney needs to review the draft which may require modifications.

- The ordinance includes a penalty. Staff approach will be to treat this as an educational opportunity. Fines would only be issued to repeat offenders.

Staff recommends passing the ordinance, pending City Attorney review, but does not have a definite recommendation on whether to set the threshold at 0.1% or 0.2% PAH content. Staff is leaning towards restricting at a 0.1% level and requesting direction from the Board in creating an ordinance to prohibit coal tar-based and other PAH containing sealants.



To: NEWSC Member Communities

From: Clean Wisconsin, Fox-Wolf Watershed Alliance, and Jon Richards

Re: Public Health Danger and Local Solutions to Coal Tar-Based Pavement Sealant Toxicity

New evidence shows that coal tar-based pavement sealants are toxic to humans, contaminate the environment, and lead to costly clean-up

- PAHs (polycyclic aromatic hydrocarbons) are found in coal tar-based sealants. PAHs are carcinogenic and cause birth defects in humans and are toxic to aquatic life.¹
- PAHs are considered persistent organic pollutants like PCBs and DDT.²
- PAHs from coal tar-based sealants pose a human health risk, especially to children. Living near a sealed driveway increases excess cancer risk by 14 times for children.³
- A 2017 study by the United States Geological Survey in the Milwaukee area found that 78% of river sediment contained high levels of toxic PAH pollution and that coal tar-based sealants are the source of 77% of PAH contamination.⁴
- PAHs get into our waterways when the sealants break down and sealant particles enter run-off into lakes and streams, they get into our homes when people track the material inside, and children are exposed to PAHs when playing near driveways and on playgrounds.⁵
- Clean-up can be incredibly costly to communities, as sediment known to be contaminated with PAHs must be removed from stormwater detention ponds and riverbeds and placed in landfills to avoid harmful exposure.⁶

Banning Coal Tar Sealants is a simple, affordable, local solution to the serious public health threat of PAH contamination

- Communities in Wisconsin and across the country are banning the use and sale of tar-based sealants containing PAHs to protect public health and the environment.⁷
- Most direct PAH contamination stays in a waterway within less than a mile of where it enters the waterway.⁸
- Communities like Austin, Texas have successfully banned PAH containing products leading to a 50% reduction in PAHs in the environment.⁹ They have developed inexpensive and easy to use screening tests that allow residents and contractors to determine if prohibited sealers have been used.¹⁰
- Alternative sealcoats are widely available and contain 1,000 times fewer PAHs.¹¹ The cost of low-PAH alternatives is about the same as tar-based sealants, and in some cases, they are even more affordable.¹²

- Starting in 2020, the EPA will no longer allow industrial facilities that use coal tar-based sealants to be eligible for general stormwater permits.¹³ According to the agency, banning coal tar sealants may be the most cost-effective approach to reducing local toxic exposure to PAHs.¹⁴
- Many retailers and contractors have discontinued use of PAH containing sealants, however these products are still available at some retailers.¹⁵ In addition, commercial applicators and contractors who get supplies through wholesalers or directly from manufacturers may still be using high-PAH products.
- For market forces to be effective, a critical mass of municipalities with bans in place is needed to reduce toxic PAH exposure in our environment.¹⁶
- In Wisconsin the following communities have passed local tar-based sealant bans:
 - City of Glendale
 - Village of Shorewood
 - City of Milwaukee
 - Village of Elm Grove
 - City of Franklin
 - Village of Whitefish Bay
 - City of Port Washington
 - Village of Brown Deer
 - City of Greenfield
 - City of Wauwatosa
 - City of West Allis
 - Village of Bayside
 - Village of Hales Corners
 - Dane County

We Can Help

- We are ready to help your community reduce toxic exposure to high-PAH sealants.
- We can provide:
 - Presentations to community decision makers
 - Technical, policy, and legal assistance
 - Model ordinances
 - Background scientific research
 - Community educational materials for residents, property owners, and contractors

Contact Our Team

- Ezra Meyer, Water Resources Specialist, Clean Wisconsin, emeyer@cleanwisconsin.org, 608-251-7020 x20
- Chad VandenLangenberg, Project Coordinator/NEWSC Coordinator, Fox-Wolf Watershed Alliance, chad@fwwa.org, 920-915-5767
- Jon Richards, Consultant to Clean Wisconsin, jonr@zgkc-law.com, 414-272-2295

References and Additional Information

[1] The US Environmental Protection Agency (USEPA) and the International Agency for Research on Cancer have identified 7 different PAHs as being probable human carcinogens, and 16 PAHs are classified as priority pollutants by the USEPA due to their toxicity. Exposure has also been linked to birth defects and developmental problems in children. PAH contamination has numerous adverse effects on aquatic invertebrates, fish, and amphibians including increased mortality, reproductive effects, organ defects, tumors, and immune system impairments. Selected references: *Lupo et al. 2012. Maternal occupational exposure to polycyclic aromatic hydrocarbons: effects on gastroschisis among offspring in the National Birth Defects Prevention study. Environmental Health Perspectives 120: 910-915; Perrera et al. 2009. Prenatal Airborne Polycyclic Aromatic Hydrocarbon Exposure and Child IQ at Age 5 Years. Pediatrics 124: 195-202; Neff et al. 2005. Ecological risk assessment of polycyclic aromatic hydrocarbons in sediments: Identifying sources and ecological hazard. Integrated Environmental Assessment and Management 1:22-33; Myers et al. 2008. Improved flatfish health following remediation of a PAH-contaminated site in Eagle Harbor, Washington. Aquatic Toxicology 88: 277-288.*

[2] Persistent organic pollutants are carbon-based chemicals that are highly toxic and persistent in the environment. Due to their chemical properties, PAHs are resistant to degradation and remain in the environment for long periods of time, leading to accumulation in local soils and sediments. *National Institutes of Health. 2017. Tox Town: Persistent Organic Pollutants (POPs). Available at: <https://toxtown.nlm.nih.gov/text_version/chemicals.php?id=86>* Last accessed January 9, 2018.

[3] House dust in homes adjacent to parking lots sealed with coal-tar sealants was found to have 25 times greater PAH concentrations than house dust adjacent to unsealed lots or lots sealed with low-PAH alternatives. It was then calculated that lifetime excess cancer risk would increase 14 times for people who lived adjacent to sealed parking lots from birth to age six due to accidental ingestion of contaminated soil and house dust. *Mahler et al. 2010. Coal-tar-based parking lot sealcoat: an unrecognized source of PAH to settled house dust. Environmental Science and Technology 44:894-900; Williams et al. 2013. Cancer risk from incidental ingestion exposures to PAHs associated with coal-tar-sealed pavement. Environmental Science and Technology 47: 1101-1109.*

[4] A 2017 United States Geological Survey study found that 78% riverbottom samples in the study area (west to Brookfield, north to Germantown, south to Greenfield) exceeded PAH thresholds indicating probable adverse effects on aquatic life. Contamination was found throughout the study area rather than being concentrated in one area. Multiple diagnostic analyses all indicated that coal tar sealants were the primary source of PAHs, contributing 77% of the PAH contamination in the area. Coal-tar-based sealants have been repeatedly identified as major contributors to PAH contamination in cities throughout the country. *Baldwin et al. 2017. Primary sources and toxicity of PAHs in Milwaukee-area streambed sediment. Environmental Toxicology and Chemistry 36: 1622-1635; Van Metre & Mahler.*

2010. *Contribution of PAHs from coal–tar pavement sealcoat and other sources to 40 U.S. lakes. Science of the Total Environment* 409: 334–344

[5] Coal tar-based sealants, which are applied to pavement to beautify and protect the asphalt surfaces of residential driveways, playgrounds, and parking lots, contain high concentrations of PAHs. As the sealcoat weathers or is worn off by vehicle traffic, loose particles are washed off into nearby soils and waterbodies. PAH-contaminated dust from the sealed surface is also transported into homes by wind and on shoes and clothing. Since sealants need to be reapplied every few years, they create a steady source of PAHs to the environment.

[6] Many municipalities use detention ponds as a stormwater pollution control measure. To maintain performance, accumulated sediment will need to be periodically removed. However, sediment containing high levels of pollutants such as PAHs may need to be landfilled at significant expense to the municipality. Inver Grove Heights, MN, (population 34,000) is estimating that removing PAH contaminated sediment from its 140 stormwater detention ponds with PAH contamination will cost between \$1.5 and \$4 million. Estimates for disposal costs in the Minneapolis-St. Paul metropolitan area are up to \$1 billion if 10% of stormwater detention ponds have PAH concentrations above Minnesota’s human-health risk-based Soil Reference Value. A study found that 2/3 of the PAHs in the stormwater ponds came from coal-tar-based sealants. *University of Wisconsin Extension. 2013. Avoiding high costs from stormwater sediments contaminated by coal tar-based asphalt sealcoats. Solid & Hazardous Waste Education Center Factsheet. Available at: < <http://shwec.engr.wisc.edu/wp-uploads/2015/08/Stormwater-Utilities-6-7-13.pdf>> Last accessed January 9, 2018; Crane. 2014. Source apportionment and distribution of polycyclic aromatic hydrocarbons, risk considerations, and management implications for urban stormwater pond sediments in Minnesota, USA. *Archive of Environmental Contamination and Toxicology* 66: 176-200.*

[7] We are aware of 37 municipalities or counties, 3 states, and the District of Columbia that have banned or restricted the use of coal tar-based sealants as of November 2017. For a full list see Clean Wisconsin factsheet entitled “Example Actions Taken on Tar-Based Sealants.”

[8] Studies suggest that, while there is some transport downstream of PAHs that enter rivers and streams, PAH contamination from localized sources (e.g., sealed parking lots) remains close to the source. One study from found that the influence of industrial and commercial land use on river sediment PAH concentrations dropped off after 500-1000 meters downstream. At greater distances those land uses were not found to be increasing PAH concentrations in the river. This indicates that PAHs are settling to the bottom within ~2/3 of a mile. Similarly, two other studies, while not measuring specific distances, found localized “hot spots” of PAH contamination adjacent to suspected sources or urban centers compared to downstream concentrations. *Augusto et al. 2011. Evaluating sources of PAHs in urban streams based on land use and biomonitors. Environmental Science and Technology* 45: 3731-3738; *Sanders & Scott. 2002. Origin and distribution of polycyclic aromatic hydrocarbons in surficial sediments from the Savannah River. Archives of Environmental Contamination and Toxicology* 43: 438-448; *Liu et al. 2013. Comparison of sedimentary PAHs in the rivers of Ammer (Germany) and Liangtan*

(China): Differences between early- and newly-industrialized countries. *Environmental Science and Technology* 47: 701-709.

[9] Researchers in Austin, TX, found that PAH concentrations in local lakes decreased by 58% in the eight years following the city's coal tar sealant ban. As far as we know this is the only place to study the effect of a ban, but other places such as Minnesota are planning to follow up after an appropriate amount of time has passed since their ban. Van Metre & Mahler. 2014. *PAH concentrations in lake sediment decline following ban on coal-tar-based pavement sealants in Austin, Texas. Environmental Science and Technology* 48: 7222-7228.

[10] A description and step-by-step instructions are available at:
<<http://www.austintexas.gov/sites/default/files/files/Watershed/coaltar/SR-12-08-sealant-solvent-screening-method.pdf>> Last accessed January 9, 2018.

[11] Asphalt emulsion sealers are a widely-available, low-PAH alternative. They appear to have similar performance, although they do require slightly warmer temperatures for application cutting shortening the application season by a week or two on each end. Coal-tar-based sealants are typically 5-10% PAHs by weight, while asphalt-based sealants are 0.005% PAHs by weight. Mahler et al. 2012. *Coal-tar-based pavement sealcoat and PAHs: implications for the environment, human health, and stormwater management. Environmental Science and Technology* 46: 3039-3045.

[12] Based on prices advertised online in December 2017, coal tar-based sealants cost \$5-10 per gallon while asphalt-based sealants cost \$5-10 per gallon. PAH-free alternatives, such as acrylic or latex sealers, are also becoming increasingly available.

[13] Under the terms of a settlement agreement in *Waterkeeper Alliance v. EPA* (2d Cir. 15-02091), the EPA will propose that industrial facilities that use coal-tar sealants “and thereby discharge polycyclic aromatic hydrocarbons (‘PAHs’) in stormwater are not eligible for coverage under the [multisector general permit] and must either eliminate such discharges or apply for an individual permit.” The full settlement agreement is available at: <[http://waterkeeper.org/wp-content/uploads/2016/08/Waterkeeper Alliance Settlement Agreement 08162016-EPA-MSGP.pdf](http://waterkeeper.org/wp-content/uploads/2016/08/Waterkeeper_Alliance_Settlement_Agreement_08162016-EPA-MSGP.pdf)> Last accessed January 9, 2018.

[14] EPA's own research found that surfaces sealed with coal-tar based sealcoat released 100-1,000 times more PAHs than other surfaces. Based on this, the agency has said that the most cost-effective approach for communities to address the toxic effects of PAH contamination may be to ban the products. *US Environmental Protection Agency. 2011. An assessment of water quality runoff from sealed asphalt surfaces. EPA/600/R-10/178.*

[15] Based on online searches in December 2017, Lowes, Home Depot, Ace Hardware, Menards, and Mills Fleet Farm do not offer coal-tar based sealants for sale. Coal-tar sealants are available from True Value and Blain's Farm and Fleet.

[16] The majority of sealcoating is done by professional applicators or contractors, who get their sealcoat in larger quantities directly from manufacturers or distributors rather than from retail stores. Furthermore, many applicators appear serve a wide area encompassing many Southeast Wisconsin municipalities. Thus, retailers in a given municipality not carrying high-PAH sealants does not address the largest use of these products. It will take prohibitions across the majority of applicators' service areas for the market to start assisting local bans in phasing out the use of the product in the region.



To: NEWSC Member Communities
From: Clean Wisconsin, Fox-Wolf Watershed Alliance, and Jon Richards
Re: Summary of sealant ban enforcement elsewhere
Date: November 15, 2018

We have asked municipalities in Wisconsin and elsewhere that have already passed ordinances banning high-PAH sealants to share their experience with enforcement. Such municipalities report that enforcement relies heavily on voluntary compliance, with the specter of substantial fines for failing to comply, and does not place a strain on municipal resources. Although ordinances passed carry fines, they are rarely if ever issued.

The model ordinance we are recommending for communities to adopt relies heavily on voluntary compliance. It does not require permitting, testing or remediation.

The municipalities we surveyed report a temporary upfront workload for initial outreach to property owners, contractors, and applicators upon passage of the ordinance, followed by periodic reminders (e.g., in newsletters or utility bills in the spring, when people are starting to think about property maintenance). A common theme is that the outreach and education about the ordinance was the most important part of the “enforcement” process.

All communities we are aware of have a fine structure (e.g., higher amounts for repeat offenders) in place for violations. However, municipalities commonly do not strictly enforce the ban against a party on the first violation. The first violation is used, instead, as an educational opportunity. As long as the fine is stiff enough to act as a deterrent to the small percentage of intentional bad actors, the high-PAH sealants will stop being used, as evidenced by the communities we’ve talked to saying they don’t see violations after the first few years.

The word quickly gets out to the limited universe of applicators and the municipalities see no, or very few, violations after the first couple of years meaning that there is minimal enforcement workload in the long term.

Dane County, Wisconsin, which has had an ordinance banning high-PAH sealants in place for nearly 10 years, provides an instructive example about how to effectively enforce such an ordinance. There, potential applicators are identified each spring via an internet search. Letters informing those applicators of the County ordinance are mailed out. The County then relies on tips, mainly from other contractors, about the use of coal-tar sealants, with some opportunistic project checks when they are encountered during normal duties. The County uses the field screening test linked below to identify potential violations that would need follow-up.

There are a variety of enforcement methods we heard about and are happy to discuss further, but in brief they are as follows:

- 1) The most common approach, and the one most commonly used in Wisconsin, is to simply have municipal staff ask for sealant product information when they encounter a sealing project while out and about on normal duties. This direct interaction has proven effective in increasing awareness about the ordinance within the affected community.
- 2) A more aggressive approach, employed by several communities in Illinois and Michigan, is to have a permit or registration system for commercial applicators. There's a small annual fee (\$100-\$200) to cover some administrative costs, and applicators must state that they will only use approved sealants. When municipal staff encounter a project, they ask to see their permit or registration. The model ordinance we are recommending to the City of Wauwatosa does not require a permitting system.
- 3) At the extreme end of the enforcement spectrum are statutorily-required quotas for parking lot tests. This was only used by Washington, DC, where they are required to test 60 parking lots a year. Their ban included funding specific to covering this enforcement. The model ordinance we are recommending to the City of Wauwatosa does not require a testing system.

To the extent a community desires to take steps beyond recommending compliance, we can assist staff on knowing how to identify high-PAH sealants based on the product name or the product's MSDS information. A list of products is attached and can be provided in a more detailed format if that would be helpful.

For parking lots that have been recently sealed but staff missed the actual application, there is also an inexpensive and easy-to-use field screening test that staff can use to screen a recently-sealed parking lot for use of a coal-tar sealant:

<http://www.austintexas.gov/sites/default/files/files/Watershed/coaltar/SR-12-08-sealant-solvent-screening-method.pdf>. A follow-up lab test would be needed to confirm the presence of coal tar to pursue enforcement.

To the extent a community desires to engage in requiring parties to remediate a surface covered with high-PAH coal tar sealant, please note that some municipalities require removal via shotblasting for egregious violations. It is very expensive to do this, and in Wisconsin it is difficult to find people who can do the work. Other places require the high-PAH sealant be covered over by a low-PAH sealant.

In summary, municipalities enforcing ordinances that ban high-PAH sealants rely on educational outreach as the main mechanism to promote compliance rather than trying to catch, punish and remediate every application.

A final note is that counties and municipalities in the Maryland/Washington, D.C. area mentioned how their work got easier as more and more places around them passed bans. Thus, as (hopefully) other nearby municipalities work together in passing bans, regional market forces kick in, further reducing enforcement workloads.



DANGEROUS DRIVEWAYS

TOXIC PAH POLLUTION

FROM TAR-BASED SEALANTS

Tar-based pavement sealants are the primary source of toxic PAH pollution in urban landscapes. Those PAHs are harmful to human health and hurt fish and other aquatic life in our lakes and rivers.

What are pavement sealants?

Pavement sealants, also known as “sealcoats” or “sealers,” are the jet-black coatings homeowners and contractors apply to residential, commercial, and industrial driveways and parking lots. There are two main types of pavement sealants on the market today: tar-based sealants (also called “coal tar-based”), and asphalt-based sealants.

The problem with tar-based pavement sealants

Pavement sealants contain **polycyclic aromatic hydrocarbons** (PAHs), which are toxic compounds that can **cause cancer and developmental problems in children**. The American Medical Association and other public health groups have urged local and state governments to ban tar-based sealants due to their harmful health effects.

How are people exposed to PAHs from tar-based sealants?

PAHs accumulate in soils, household dust, and carpets when particles of tar-based sealants are blown or tracked into homes, schools, and other buildings. The particles come from those sealants being worn down over time by weather, tire abrasion, and foot traffic. The toxic sealant particles are also washed off by rain and spring meltwater, ending up in our local water bodies.

A recent study found that 77% of PAH pollution in Milwaukee streambeds came from tar-based sealants.

How significant is the health risk?

The coal tar pitch used in tar-based sealants is classified as a **hazardous waste**. Children living in homes where parking lots are coated with tar-based pavement sealants face a **14-fold increase in cancer risk** compared to those living next to unsealed lots, according to researchers at Baylor University and the U.S. Geological Survey. ***A lifetime of exposure can lead to cancer rates 38 times higher.***



CHILDREN LIVING FROM BIRTH TO
AGE 6 NEAR PARKING LOTS WITH
TAR-BASED SEALANTS HAVE A
**14x HIGHER LIFETIME
CANCER RISK**

Current Tar-Based Sealant Bans:

Ann Arbor, Michigan
Annapolis/Anne Arundel County, Maryland
Austin, Texas
Boone, North Carolina (use restriction)
Cwlth. of Massachusetts (use restriction)
Dane County, Wisconsin
Dexter, Michigan
Edwards Aquifer Authority, Texas
Elm Grove, Wisconsin
Glendale, Wisconsin
Greenville, South Carolina
Hamburg Township, Michigan
Milwaukee, Wisconsin
Montgomery County, Maryland
North Barrington, Illinois
Prince George's County, Maryland
San Antonio, Texas
San Marcos, Texas
Scio Township, Michigan
Shorewood, Wisconsin
South Barrington, Illinois
Spring Lake Township, Michigan
State of Minnesota
State of Washington
Suffolk County, New York
Van Buren Township, Michigan
Washington, D.C.
Westwood, Massachusetts
Winfield, Kansas
Winnetka, Illinois
Ypsilanti, Michigan
... plus 13 others (and counting)



“Whether sending their children to a playground or repairing a driveway,

Americans are potentially being exposed to harmful carcinogens in coal-tar-based sealcoats.”

– American Medical Assoc.

How to be PAH-safe:

Don't use tar-based pavement sealants

If you feel you must seal your driveway or parking lot, then use asphalt-based sealants, which have 1,000-times lower PAH levels.

Remove your shoes

If you don't have control over your parking lot or driveway, try to keep sealant dust and soil out of your home by taking off shoes before entering.

Look for hidden PAHs

Tar can have a lot of different names, and some other byproducts can have very high levels of PAHs. To be safe, check the “Material Safety Data Sheet” of the product (try searching online) and avoid anything including CAS #'s **64742-90-1, 65996-92-1, 65996-93-2, 65996-89-6, 69013-21-4, or 8007-45-2.**

Speak up

Become an advocate in your community against the use of tar-based pavement sealants. More at cleanwisconsin.org/our-work/pah.

Environmental impacts

PAHs **kill small organisms** living on the bottoms of rivers and streams and can **cause tumors in fish and other large aquatic animals**. This could result in costly impacts on the ecological balance of aquatic environments. Even three months or more after sealants are applied, the tar-sealed pavement runoff can kill fathead minnows and water fleas, two indicator species used to assess chemical toxicity to aquatic life.

Economic Impacts

PAH pollution from tar-based sealants can be a significant burden to taxpayers when municipalities are on the hook for cleaning up stormwater sediment ponds contaminated with PAH-laden sediment. In the Minneapolis metro area, the PAH cleanup from tar-based sealants is estimated to cost taxpayers hundreds of millions of dollars.

Are there alternatives?

Yes. Asphalt-based pavement sealants have up to 1,000-times lower PAH levels and are no more expensive than tar-based sealants. Alternatives such as acrylic sealants or gravel parking lots and driveways have minimal PAH levels. Studies of an early PAH ban in Austin, Texas, show significant PAH reductions in local waterbodies.

How do tar-based sealants compare to other PAH sources?

Other sources of environmental PAH pollution have significantly lower concentrations than tar-based sealants. Fresh asphalt, for example is about 1.5 parts per million (ppm) PAHs. Smoke from wood fires can range from 2 to 114 ppm, engine exhaust 102-370 ppm, and used motor oil around 440 ppm. **Tar-based sealants are hundreds to thousands of times worse**, at 70,000 – 100,000 ppm.

WE IN WISCONSIN NEED TO FOLLOW THE LEAD OF OTHERS AND END THE SALE AND USE OF HIGH-PAH SEALANTS TO PROTECT OUR HEALTH AND ENVIRONMENT.

Visit cleanwisconsin.org/our-work/pah for more information.

Ezra Meyer

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Jon Richards

Project Coordinator
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LAKELINE

Volume 37, No. 1 • Spring 2017



PAHs in Lakes

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James A. Brown, Water production manager, Newton County, Georgia

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Call for Abstracts

November 6–9, 2017

The Westin Westminster • Westminster, Colorado

Conference Theme

Colorado's water is used for fishing, drinking, farming, rafting, camping, mining, ranching, boating, snowmaking, brewing, and much more. All of these uses are supported with a statewide annual average of just 17 inches of rainfall. The lakes and reservoirs throughout the West and the Rockies do so much and finding balance in how we manage them is vital to meeting the ever-increasing demand for water.



Finding Balance is the key to managing our lakes, reservoirs, watersheds, and even day-to-day relationships with people. Come to Colorado in 2017 to hear some fascinating lake talks, see the mountains, and to hopefully find balance.

After 26 years, the Colorado Lake and Reservoir Management Association welcomes NALMS back to the headwaters state. Colorado is home to thousands of both natural alpine lakes and reservoirs across the state. We are proud of our mountains and appreciate the importance of our lakes and reservoirs. The conference will be held at the Westin Westminster, located between Denver and Boulder.

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General Conference, Exhibitor & Sponsorship Information

NALMS Office

608-233-2836 • www.nalms.org

Preliminary Session Topics

We encourage the submission of abstracts for papers or posters on any of the topics listed below, or abstracts that address topics of broad interest to the lake and reservoir management community.

- Reservoir Management
- Case Studies – both successful and less than successful
- Mixing and Aeration Systems
- National Lakes Assessment
- Alum treatment
- Harmful Algal Blooms
- Drinking Water Treatment
- Arid West Issues
- Invasive Species
- Inter-basin Water Transfers
- Western Water Law
- Watershed Management, including Wildfire Impacts and Acid Mine Drainage
- Water Quality Monitoring
- Climate Change Impacts
- Citizen Science
- Storm Water Impacts
- Agricultural Uses
- National Park Lakes and Reservoirs
- Data Analysis and Innovative Visualization Techniques
- Model Applications
- Regulatory Framework
- Communicating Lake Issues to Users and Other Stakeholders
- African Lakes
- Central and South American Lakes
- Beersheds and Brewing

Important Dates

May 31, 2017

Abstracts due.

Late Spring

Registration opens.

August 25, 2017

Registration and payment from presenters of accepted abstracts due.

September 15, 2017

Early-bird registration deadline.

October 27, 2017

Regular registration deadline.

Visit www.nalms.org/nalms2017 for more information and to submit your abstract.

LAKE LINE

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On the cover:

2016 NALMS Photography Contest
Editor's Choice Award winner – "Peaceful
Foggy Morning" by Mark Howarth.
Wildlife and aquatic organisms like this
magnificent Great Blue Heron can be
harmed by PAHs in the environment.

From the Editor

Bill Jones

Spring is upon us and the longer days and warmer temperatures signal the time when many homeowners, businesses, agencies, and other organizations begin the annual task of working on priority outdoor maintenance projects around the home and community. Sometimes, however, projects that address an issue in one area can have unintended consequences that can be harmful in another area. The theme of our spring 2017 issue of *LakeLine* focuses on one

LakeLine encourages letters to the editor. Do you have a lake-related question? Or, have you read something in *LakeLine* that stimulates your interest? We'd love to hear from you via e-mail, telephone, or postal letter.

such issue. It is devoted to communicating what we've recently learned about a class of potentially toxic organic contaminants – **polycyclic aromatic hydrocarbons (PAHs)** – in urban lakes and streams.

Q) What are polycyclic aromatic hydrocarbons (PAHs)?

A) PAHs are a large group of organic compounds created by heating or burning materials that contain carbon. They are an environmental concern because many have been shown to cause cancer, birth defects, or death in fish, invertebrates, and other wildlife. The U.S. Environmental Protection Agency (EPA) has classified seven PAHs as probable human carcinogens (Class B2) and 16 PAHs as Priority Pollutants. Environmental and health effects depend on which PAHs are present and their concentrations. Exposure to sunlight greatly intensifies the adverse effects of several PAHs. In the urban environment, PAHs almost always occur as mixtures, reflecting their many different sources. Most PAHs are insoluble in water. Thus, in the environment, they tend to accumulate in soils and sediments (Figure 1).



Figure 1. Several common PAH compounds showing different arrangement of benzene rings. (Peter Van Metre, U.S. Geological Survey).

Monitoring and research during the past 20 years by the U.S. Geological Survey has shown unexpected and alarming increases in concentrations of PAHs – in sediments of urban lakes across the United States while concentrations of other contaminants of concern, such as DDT and PCBs, were flat or decreasing (Figure 2).

Additional work done by state and federal agencies and universities has found that coal-tar sealcoat, applied to restore and protect asphalt driveways, parking lots, playgrounds, and hiking trails, is one of the largest sources of PAHs to urban streams and lakes. Over time, sealcoat wears off asphalt due to the abrasive action of vehicle tires and foot traffic. Small particles of sealcoat attach and mix with the dust on the pavement and wash off with stormwater where it may be transported directly to streams and lakes or may accumulate in the sediment of stormwater detention ponds. The accumulation in sediment ponds can result in considerable expense to communities that are responsible for the disposal of the contaminated sediment.

Spring is the season most commonly recommended for repairing and restoring asphalt surfaces through the application of sealcoat. So, in addition to describing the science that has been done on the trends, sources of these contaminants in urban watersheds, and their potential effects to humans and aquatic ecosystems, information about what local and State agencies are doing to successfully address some of the concerns related to coal-tar sealcoat and key best practices for use by homeowners in repairing and restoring asphalt pavement surfaces is provided.

We begin this issue with an article by **Peter Van Metre** and **Barbara Mahler** of the U.S. Geological Survey,

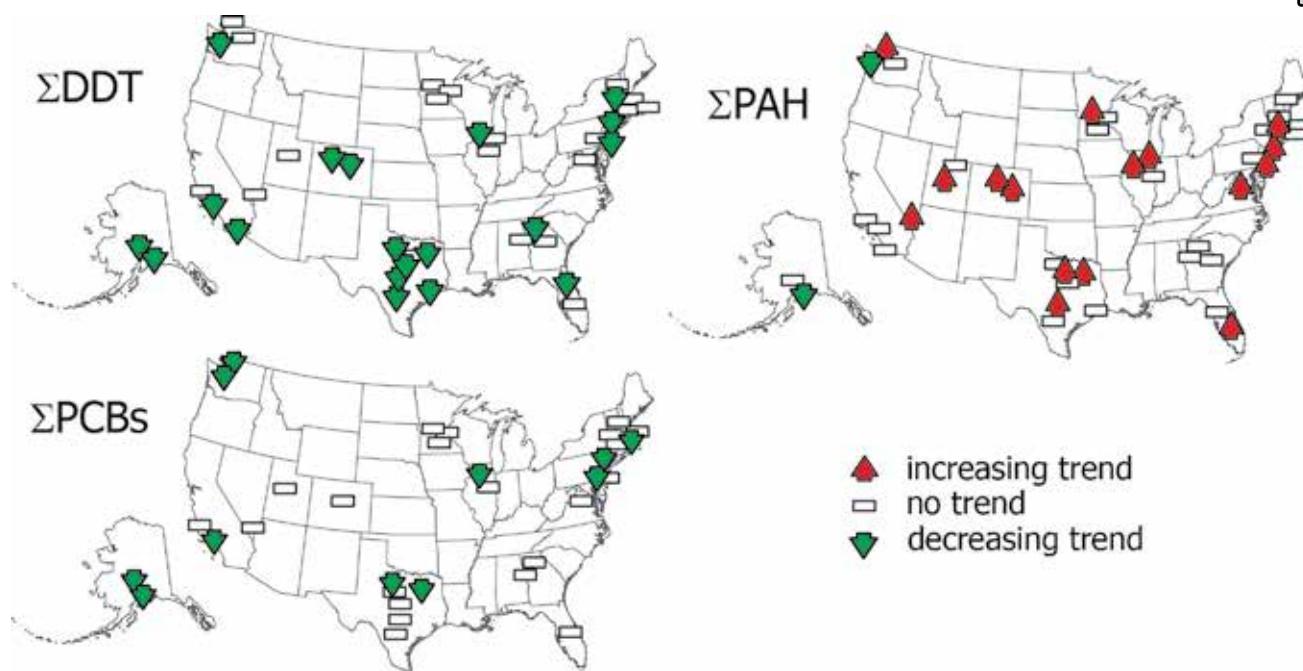


Figure 2. Map of U.S. showing trends in concentrations of PCBs, DDT, and PAHs in urban and reference lakes from 1970 to 2001.

Q) What is coal tar?

A) Coal tar is a thick, black or brown liquid that is a byproduct of the coking of coal for the steel industry or the gasification of coal to make coal gas. Coal-tar pitch is the residue that remains after various light oils are distilled from crude coal tar for commercial use. Coal-tar pitch is separated (refined) into 12 different viscosities, RT-1 (the most fluid) through RT-12 (the most viscous, and the viscosity used in coal-tar-based pavement sealcoat). Coal-tar emulsion pavement sealants contain either crude coal tar (Chemical Abstracts Service [CAS] Registry Number 8007-45-2) or coal-tar pitch (CAS Registry Number 65996-93-2). Coal tar and coal-tar pitch are known human carcinogens.

that presents findings from studies of 38 urban and reference lakes from across the nation that were sampled to determine how concentrations of contaminants in the environment were changing with time. The results of these studies showed improvements in water quality for some contaminants that have historically been of concern; but, unexpectedly, also showed that concentrations of PAHs were increasing in and around urban areas raising concerns that PAHs were becoming a threat to aquatic biota in urban streams and lakes. Research findings from work done to determine the relative contributions of PAHs from different sources in the urban environment is also presented.

In the second article, **Barbara Mahler** and **Peter Van Metre** summarize findings from field studies comparing PAH levels in soils, dust, runoff, and air on or near sealcoated pavement and

pavement without sealcoat that provides additional lines of evidence about the potency of coal-tar-based sealcoat as a major source of PAH contamination in urban and suburban areas.

In the third article, **Spencer Williams**, formerly a research assistant professor at Baylor University's Environmental Health Science Program, summarizes findings from several studies that provide insights about the potential human health effects from exposures to PAHs associated with coal-tar-sealed pavement.

Jenifer K. McIntyre, authored the fourth article that summarizes what has been learned from studies examining the potential health effects to aquatic life from PAHs in stormwater runoff associated with sealcoat. Jenifer is currently an assistant professor for the School of the Environment at the Research and Extension Center for Washington State

University (WSU). She is also the lead on collaborative research projects between NOAA-Fisheries, the U.S. Fish and Wildlife Service, and the WSU Puyallup Research and Extension Center on the biological effectiveness of green stormwater infrastructure (GSI) for pollution reduction.

The fifth article in this issue is authored by **Al Innes**, an environmental planner and pollution prevention and green chemistry specialist with the Minnesota Pollution Control Agency. Al's article shares the history and lessons learned from applying Minnesota's Toxic Pollution Prevention Program to the release of PAHs from coal-tar-based sealcoats in Minnesota and elsewhere around the Great Lakes. Minnesota's approach – addressing environmental issues where they originate and before there is an impact has helped improve the net profits of the business community, while helping to improve the health, environment, and sustainability of the State's natural resources.

The final section of the PAH-themed articles includes a few additional Frequently Asked Questions that are intended to be helpful to those that may be considering a project that involves the application of sealcoat or know of others

(From the Editor, continued on p. 7 . . .)

From Frank Wilhelm the President

Welcome to the spring issue of *LakeLine*. By the time you read this, hopefully there are signs of spring and renewal where you live, because as I write the column a new four inches of snow has accumulated overnight after we were teased with green grass and warm temperatures across the Pacific Northwest (PNW). It looks like winter will hang on for a bit more, and it's not quite time to hang up the shovel just yet. While I, and I'm sure many others, don't particularly like heaving snow around to get out of the house and driveway, I realize that precipitation in flake form as opposed to rain these days builds the mountain snow pack, a vital source of water for later in the year here in the west. Not only does a healthy mountain snowpack bode well for a good summer white water rafting season, it also maintains abundant and cold stream and river flows for our fish, not to mention a steady summer supply to lakes and reservoirs, the latter of which serve a variety of purposes – one of them being for irrigated agriculture in areas where this would not be possible otherwise. Here in the West, a healthy snow pack is vital to make the world go around as usual or “normal” given the systems and culture that have come to rely on it. However, we best start thinking about a “new” normal.

Having just poked around some long-term climate data for the PNW with a graduate student to examine the frequency of rain-on-snow (ROS) events – as these relate to flooding and the movement of heavy metal laden sediments from legacy mining in the Coeur D'Alene area, it was alarming to see the general trends across the West reported in the peer-reviewed scientific literature: (1) less precipitation overall, (2) warming winter air temperatures, and thus a rise in

elevation at which precipitation falls and accumulates as snow, and (3) declines in the ratio of snow/rain precipitation – meaning less precipitation as snow and more as rain. A disappearing snow pack across the West does not bode well for reliance on water from a “normal” snow pack. We know that life depends on access to water, as do farms that grow food, so if the normal life-giving flow from mountain snow packs will diminish in the future, we had best come together collectively to figure out the “new” normal. This will not be easy by any means, and we'll need to decide on trade-offs as we establish a new norm for our water supplies.

Similarly, we live in a world that relies extensively on hydrocarbons and their byproducts. While there are obvious conveniences such as the freedoms afforded by individual automobiles and the availability of new materials, these conveniences come with trade-offs that significantly affect our natural and aquatic environment as you'll read in this issue. Again, it is through collective dialog that

we will establish what is, and what is not acceptable – don't expect everyone to be happy at the end of the process.

It is the norming of what is and what is not acceptable that has me very concerned at the moment as we learn what is “normal” or to be expected of the new administration in D.C. Regulations for our environment via the Environmental Protection Agency (EPA) were born out of a collective will by U.S. citizens for a healthy environment capable of supporting us, and recovering what has been polluted. You read the editor's column last month about the re-authorized but unfunded section 314 Clean Lakes Program of the Clean Water Act and what is and what is not happening around the nation with regards to our lakes. I am disappointed to see that H.R. 681 “To terminate the Environmental Protection Agency” (<https://www.congress.gov/bill/115th-congress/house-bill/861>) aimed to terminate the EPA by December 2018, was introduced by Rep. Matt Gaetz, [R-FL-1] on Feb 3rd, 2017. In addition,

Next Issue – Summer 2017 *LakeLine*

As we have done every other summer for the past six years, our next issue focuses on Harmful Algal Blooms (HABs).

The NALMS Inland HAB Program leaders, Angela Shambaugh and Shane Bradt, have contacted leading HAB researchers in the field to present the latest findings and information for this issue.



H.R. 637, “Stopping EPA overreach Act of 2017” (<https://www.congress.gov/bill/115th-congress/house-bill/637>), aimed to stop the EPA from taking actions not originally intended by Congress, “incorrectly” labeling greenhouse gasses as air pollutants, and identifying no regulation of climate change, etc., was introduced by Rep. Gary, J. Palmer, [R-AL-6] on Jan 24th, 2017 with 121 co-sponsors. The ramifications of these bills should give collective pause for thought – who will mind the proverbial store? In the face of an expanding human population that relies on water and its environment for survival now is not the time to abandon the EPA, or we might as well be drinking with a straw from our own diaper. As a citizen, it is your responsibility to inform yourself and participate in our democratic process.

To end on a positive note, check out the current George Barley Water Prize competition hosted by the Everglades Foundation (<http://www.barleyprize.com/>), a four-year, stepped competition with a \$10-million prize to the team who develops the most cost-effective, scalable technology that thoroughly removes and recovers phosphorus from freshwater bodies. The final phase will be a fully functioning operations plant. Now that’s exciting for renewal and a new norm – think of the possibilities for our waters!

Frank Wilhelm is an associate professor of limnology at the University of Idaho in Moscow, Idaho, where he teaches courses in limnology and in the introductory sequence of natural resources course. He has an active research program focused broadly on limnology including cyanobacteria, invasive species, nutrient cycling, and foodweb dynamics. He has been an active member of NALMS, having served on various committees and as Region 10 director previously. 🐼



(...from the Editor, continued from p. 5)

planning such a project. Information is provided on: How to determine whether a particular sealant product contains coal tar; How to determine whether the existing sealant on your driveway contains coal tar; Alternative products to coal-tar sealcoat; and Best practices for maintaining and applying sealcoat.

In our “Student Corner,” **Andrew Labaj** and **Branaavan Sivarajah**, students in the Paleoeological Environmental Assessment and Research Laboratory (PEARL) at Queen’s University in Ontario describe their research into using lake sediments to assess the long-term ecological consequences of mining in Canada.

In his column, NALMS President **Frank Wilhelm** shares his concerns for the future of water resources and some hope. Although the successful Banff Symposium is still on our minds, it is time to make plans for the NALMS Denver Symposium, November 6-9, 2017. We include the Call for Papers in this issue. We also include announcements for the annual Lakes Appreciation Month and NALMS Photo Contest.

We conclude this issue with “Literature Search.” Enjoy!

References

Mahler, B.J., M.D. Woodside and P.C. Van Metre. 2016. Coal tar based pavement sealcoat-potential concerns for human health and aquatic life. U.S. Geological

Survey. Fact Sheet 2016-3017, 6p. <https://pubs.er.usgs.gov/publication/fs20163017>

Minnesota Pollution Control Agency.

Coal tar-based sealcoat frequently asked questions. <https://www.pca.state.mn.us/water/coal-tar-based-sealcoat-faqs>

U.S. Environmental Protection Agency.

2012. Stormwater best management practices-coal-tar sealant, polycyclic aromatic hydrocarbons, and stormwater pollution. EPA 833-F-12-004. 2p. <https://www3.epa.gov/npdes/pubs/coaltar.pdf>

Van Metre, P.C. and B.J. Mahler. 2005.

Trends in hydrophobic organic contaminants in urban and reference lake sediments across the United States, 1970-2001. *Environmental Science and Technology*, 39 (15): 5567-5574. <https://tx.usgs.gov/coring/pubs/trends%20organics.pdf>

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Trends and Sources of PAHs to Urban Lakes & Streams

Peter Van Metre and Barbara Mahler

Over the past few decades, concentrations of polycyclic aromatic hydrocarbons (PAHs) have been increasing in the sediments of many U.S. urban lakes and streams. These upward trends contrast those of legacy pollutants, such as lead, PCBs, and DDT, which were restricted or banned in the 1970s. Trends of these legacy pollutants have been downward since they were banned (Figures 1 and 2).

Understanding the causes of trends in PAHs is complicated by their many natural and anthropogenic sources. PAHs are contained in fossil fuels and also are produced when materials that contain carbon, including oil, coal, gasoline, and diesel fuel, are heated or burned. Although many studies have considered vehicle emissions as a potential source of urban PAHs, estimated emissions of PAHs from vehicles in the United States declined almost ten-fold from 1971 (32,000 metric tons, or Mg) to 2000 (3,500 Mg), and this decline continues. Vehicle emissions therefore cannot account for the upward trend found in urban lake sediments – there must be some other primary source or sources of the upward trend in PAHs.

Discovery of Sealcoat as a PAH Source

A breakthrough in identifying urban PAH sources occurred in 2003, when scientists with the City of Austin (COA), TX, measured PAHs in sediment samples from very small streams in Austin. The PAH concentrations in some samples were extremely elevated – in the 1000s of milligrams per kilogram (mg/kg), on par with concentrations measured in some Superfund site soils. A COA scientist noted that the sites with the elevated PAH concentrations were immediately downstream from parking lots that had a black sealer on the surface. The sealer was

coal-tar-based pavement sealcoat. Coal tar and coal-tar pitch, which are used in coal-tar sealcoat, consist of about 50 percent or more PAHs and are known human carcinogens (Figure 3).

In collaboration with the COA, U.S. Geological Survey (USGS) researchers carried out a series of tests to measure concentrations and yields (the amount leaving the pavement per unit area) of PAHs in runoff from sealed and unsealed pavement. The study was the first to document coal-tar sealcoat as a potentially major source of PAHs in urban runoff (Mahler et al. 2005).

An East-West Divide

One straightforward line of evidence is to compare PAH concentrations in areas where coal-tar sealcoat is used to concentrations in areas where it is not used. In the United States, there is a general east-west difference in the type of pavement sealant product used: high-PAH coal-tar-based sealants are predominantly used east of the Continental Divide, and low-PAH asphalt-based sealants are predominantly used in the West. This difference in use is reflected in PAH concentrations in urban lakes (Mahler et al. 2012). Lakes in the central and eastern U.S. tend to have higher PAH concentrations in sediment than lakes in the western U.S. for a similar level of urban development. A comparison of

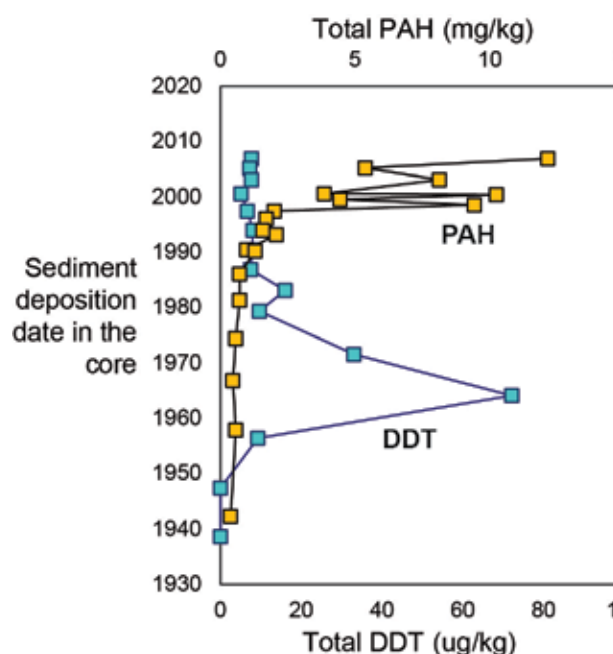


Figure 1. Contaminant profiles from Lake in the Hills, suburban Chicago, IL, indicate contrasting trends for (total) DDT and (total) PAHs.

Lake Anne in Reston, VA, and Decker Lake in Salt Lake City, UT, illustrates this east-west difference. Both are small lakes with fully developed watersheds, and both have a population of about 2,100 people per square kilometer. Yet PAH levels in Lake Anne sediment are about 20 times higher than in Decker Lake sediment, with mean concentrations of PAH of 17 and 0.76 mg/kg, respectively, for sediment deposited in the 1990s (Van Metre and Mahler 2010). PAH concentrations in dust samples collected from sealed pavement in the two watersheds point to a likely explanation: 3,200 mg/kg for pavement dust in the Lake Anne watershed and 2.1 mg/kg in the Decker Lake watershed. This thousand-fold difference is consistent with the difference in PAH concentrations between the coal tar and asphalt products



Figure 2. A break during sediment core sampling at Lake in the Hills, IL.



Figure 3. Freshly applied coal-tar sealcoat gives this parking lot a new look.

(Mahler et al. 2012). The fact that PAH concentrations in western urban lakes are relatively low indicates that commercial and residential development – and even interstate highways – do not necessarily lead to high “urban background” levels of PAHs.

Quantifying the PAH Contribution of Coal-Tar Sealcoat

Just how important is coal-tar sealcoat as a source of PAHs to urban waterbodies? In other words, what percentage of the PAHs in urban lakes

and streams is coming from coal-tar-sealed pavement compared with other PAH sources? Several research groups have used multiple lines of evidence to address this question. The consensus that has emerged is that coal-tar sealcoat use accounts for roughly 50 percent to as much as 90 percent of the PAHs in urban streams, lakes, and stormwater ponds studied in the central and eastern United States (Mahler et al. 2012; Pavlowsky 2013; Crane 2014; Baldwin et al. 2016).

Coal-tar-sealed pavement was demonstrated to be the dominant source

of PAHs to urban streams and ponds in Springfield, MO, contributing more than 80 percent of the PAHs (Pavlowsky 2013). This study found a strong relation between PAH concentrations in stream sediments and the area of the watershed upstream from the sampling point that was sealed pavement. PAH concentrations increased as the amount of sealed pavement in the watershed increased, but did not show a relation to total impervious cover, thus indicating sealcoat as the source. Samples of dust from coal-tar-sealed parking lots and the sediment from stream sites draining those lots were enriched in PAHs at concentrations considered toxic to aquatic life based on comparison to widely used sediment quality guidelines.

In the environment, PAHs always occur in complex mixtures of many compounds. PAH sources tend to have a characteristic mixtures of PAHs, which can be thought of as PAH “fingerprints.” This is useful, because the fingerprints provide a “forensic” approach for determining the PAH sources to stream or lake sediment. Statistical “source-receptor” models have been developed that use chemical fingerprints to estimate the contribution of each PAH potential source (such as tire particles, used motor oil, and wood burning) to a receptor (such as stream or lake sediment). We applied a source-receptor model (the U.S. Environmental Protection Agency’s Contaminant Mass Balance (CMB) model) to PAH concentrations in the upper layer of sediment collected from 40 lakes from across the United States (35 medium and small urban lakes and 5 large lakes with a mixture of land uses). The results of the model indicated that, overall, coal-tar sealcoat was the largest source of PAHs to the lakes, accounting for, on average, about one-half of the PAHs in recent sediments (Figure 4) (Van Metre and Mahler 2010). Many of the lakes in the central and eastern U.S. had PAH concentrations that exceeded the probable effect concentration (PEC), indicating PAH concentrations that are expected to be toxic to some types of aquatic life.

More recent studies that have used the CMB model and other forensic techniques separately or in combination also have concluded that coal-tar sealcoat is a major PAH source to urban

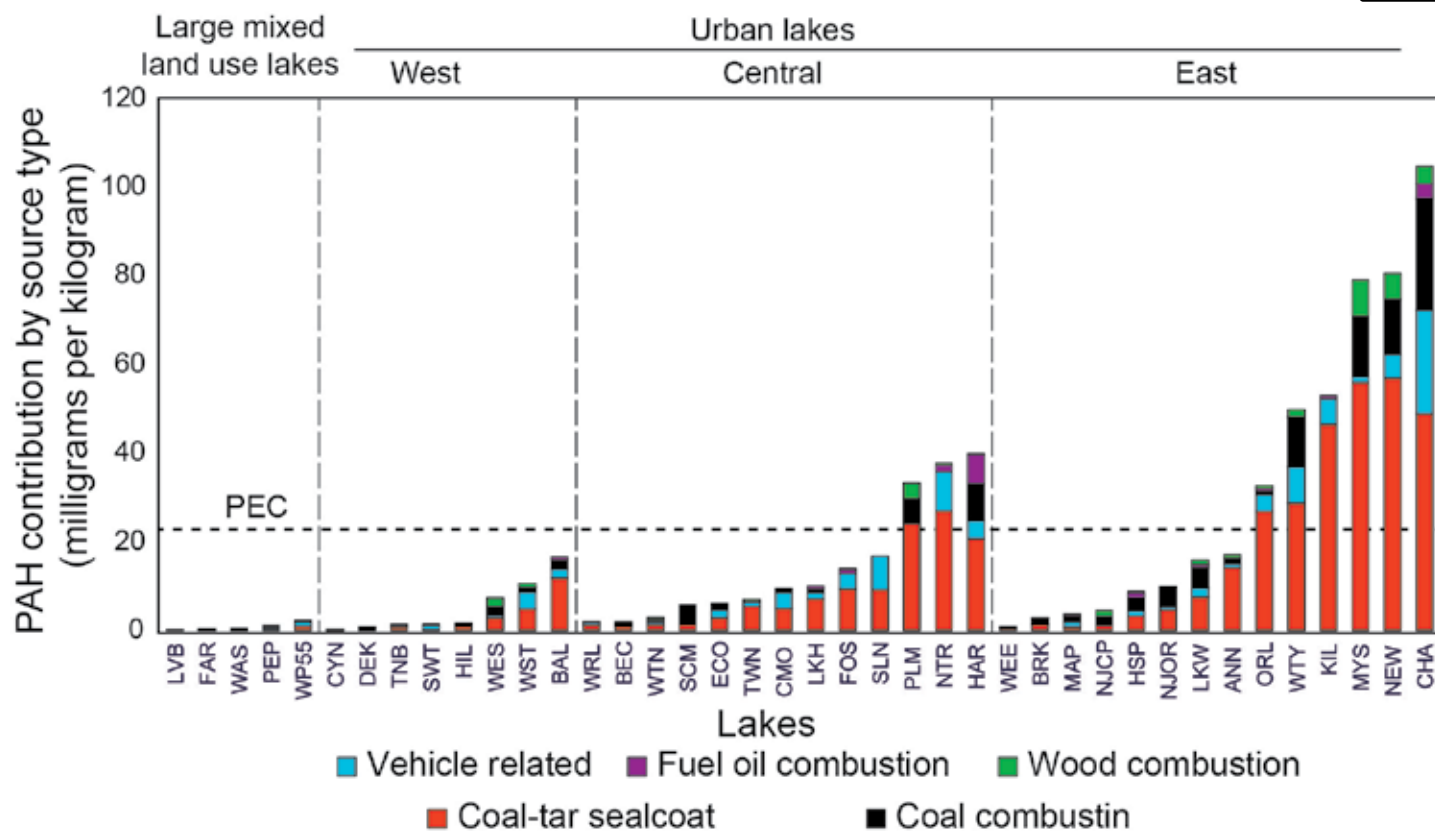


Figure 4. Coal-tar sealcoat was the largest source of PAHs to 40 lakes studied by the USGS (Van Metre and Mahler 2010).

waterbodies (Crane 2014; Witter et al. 2014; Baldwin et al. 2016). In one of the most comprehensive studies of PAH sources to date, researchers from the USGS and the City of Milwaukee, WI, applied six different forensic approaches to assess sources of PAHs in Milwaukee stream sediment (Baldwin et al. 2016). On the basis of this multiple-lines-of-evidence approach, the researchers concluded that coal-tar sealcoat was the primary source of PAHs to the streams, contributing an estimated 77 percent of total PAHs to stream sediment sampled. They also reported that 75 percent of the samples were toxic to standard toxicity test organisms, and that PAHs were the cause of the toxicity.

Other studies have taken different tactics to evaluate the importance of coal-tar sealcoat as a source of PAHs to urban waterbodies. In one study, a research team from the University of Illinois used microscopic analysis to identify the different types of carbonaceous material (CM) present in samples of pavement dust, soils, streambed sediment, and lake (reservoir) sediment collected in Fort Worth, TX (Yang et al. 2010).

Carbonaceous materials, such as soot, coal tar, and asphalt, are of interest because they are the primary vectors (carriers) that transport PAHs into urban waters. The researchers characterized PAH concentrations associated with the CM and concluded that coal-tar pitch (used in coal-tar sealcoat) contributed as much as 99 percent of the PAHs in sealed parking lot dust, 92 percent in unsealed parking lot dust, 88 percent in a composite soil sample from a commercial area with some sealed parking lots, 71 percent in streambed sediment, and 84 percent in lake sediment. The identification of coal-tar sealcoat as the main source of PAHs in unsealed parking lot dust and commercial soils demonstrates the potential for these contaminants to move to neighboring areas by wind and tracking on tires.

PAH Trends in Lakes Linked to Coal-Tar Sealcoat Use

Returning to our original question, is coal-tar sealcoat responsible for the upward trends in PAHs measured in some urban lakes? To address this question, we applied the CMB model to the whole sediment-core record for eight urban lakes

from across the United States. In the six lakes that had statistically significant upward trends in PAHs since 1970, coal-tar sealcoat was identified by the CMB model as the primary source of the increase in concentrations (Figure 5).

Given the importance of coal-tar sealcoat as a source of PAHs to urban lakes, what happens when its use is curtailed? In January 2006, Austin, TX, became the first jurisdiction in the United States to ban use of coal-tar sealcoat, providing a unique opportunity to address this question. Much of the runoff from the City of Austin flows into Lady Bird Lake, a 9-km-long impoundment on the Colorado River. PAH concentrations in Lady Bird Lake sediment increased for the four decades prior to the ban. We collected sediment cores and surficial bottom sediment samples from the lake in 2012 and 2014, which were six and eight years after implementation of the coal-tar-sealcoat ban (Van Metre and Mahler 2014). PAH concentrations in that period after the ban was imposed had decreased by about 58 percent relative to the 1998–2005 mean (Figure 6). This rate of decrease is consistent with those measured

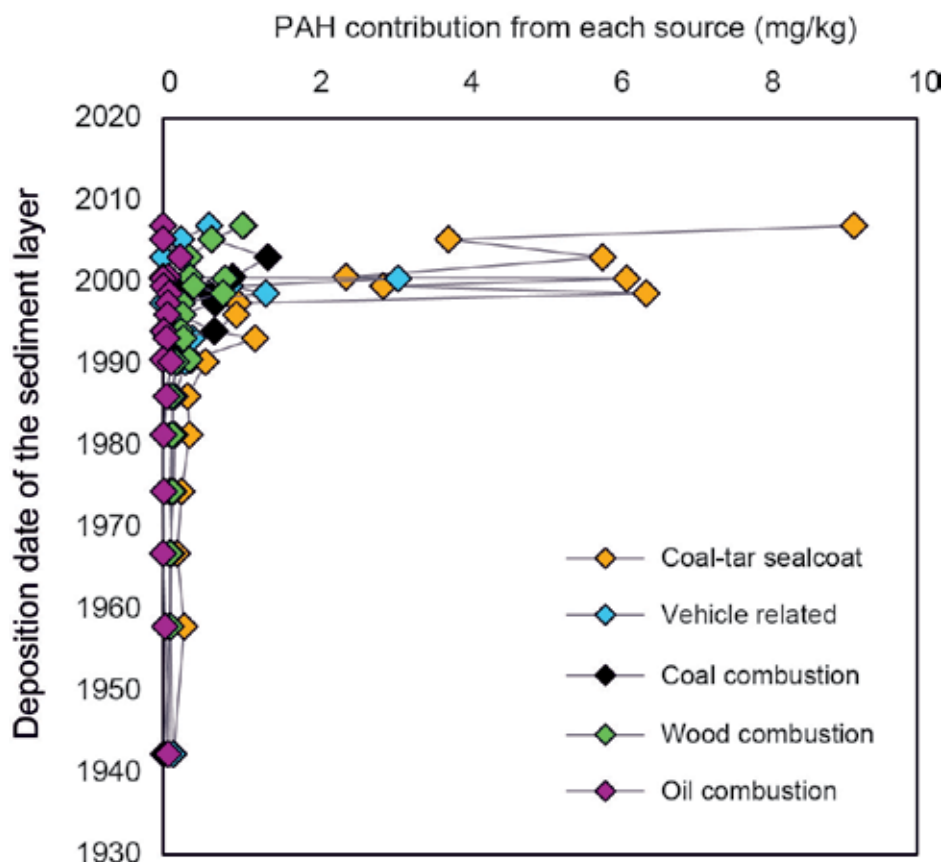


Figure 5. The rapid increase in PAH concentrations in recent years at Lake in the Hills, IL, was primarily from coal-tar sealcoat, which contributed ~70 percent of the PAHs in post-2000 sediment (Van Metre and Mahler 2010).

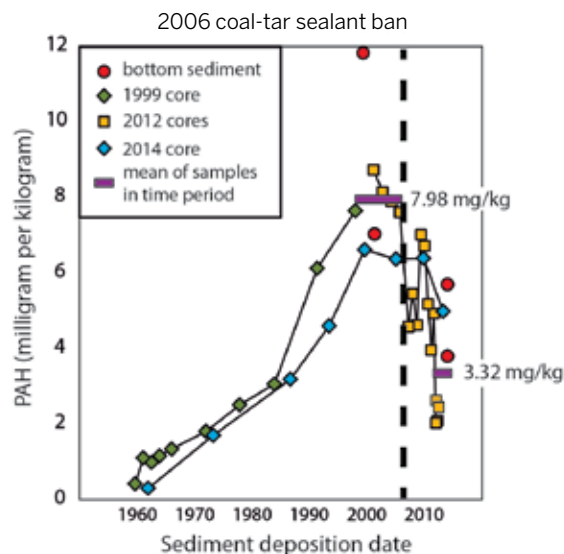


Figure 6. PAH concentrations increased for about 40 years in Lady Bird Lake in Austin, TX, until a ban on coal-tar sealcoat was instituted in 2006. In the eight years following the ban, average concentrations have decreased about 58 percent (Van Metre and Mahler 2014).

for other banned chemicals, such as DDT and PCBs. Recently deposited sediment in Lady Bird Lake continues to contain PAHs that, despite their lower concentration, still have a coal-tar signature. This finding implies that PAH concentrations likely will continue to decline as stocks of previously applied sealant gradually become depleted.

References

- Baldwin, A.K., S.R. Corsi, M.A. Lutz, C.G. Ingersoll, R. Dorman, C. Magruder and M. Magruder. 2016. Primary sources and toxicity of PAHs in Milwaukee-area streambed sediment. *Environ Toxicol Chem*, DOI: 10.1002/etc.3694
- Crane, J.L. 2014. Source apportionment and distribution of polycyclic aromatic hydrocarbons, risk considerations, and management implications for urban stormwater pond sediments in Minnesota, USA. *Arch Environ Contam Toxicol*, 66(2): 25.
- Mahler, B.J., P.C. Van Metre, T.J. Bashara, J.T. Wilson and D.A. Johns. 2005. Parking lot sealcoat: An unrecognized source of urban PAHs. *Environ Sci Technol*, 39(15): 5560-5566.
- Mahler, B.J., P.C. Van Metre, J.L. Crane, A.W. Watts, M. Scoggins and E.S. Williams. 2012. Coal-tar-based pavement sealcoat and PAHs: Implications for the environment, human health, and stormwater management. *Environ Sci Technol*, 46: 3039-3045.



Pavlovsky, R. T. 2013. Coal-tar pavement sealant use and polycyclic aromatic hydrocarbon contamination in urban stream sediments. *Physical Geography*, 34(4-5): 392-415.

Van Metre, P.C. and B.J. Mahler. 2010. Contribution of PAHs from coal-tar pavement sealcoat and other sources to 40 U.S. Lakes. *Sci of the Total Environ*, 409: 334-344.

Van Metre, P. C. and B.J. Mahler. 2014. PAH concentrations in lake sediment decline following ban on coal-tar-based pavement sealants in Austin, Texas. *Environ Sci Technol*, 48(13): 7222-7228.

Witter, A.E., M.H. Nguyen, S. Baidar and P.B. Sak. 2014. Coal-tar-based sealcoated pavement: A major PAH source to urban stream sediments. *Environ. Pollution*, 185: 59-68.

Yang, Y., P.C. Van Metre, B.J. Mahler, J.T. Wilson, B. Ligouis, M.M. Razzaque, D.J. Schaeffer and C.J. Werth. 2010. Influence of coal-tar sealcoat and other carbonaceous materials on polycyclic aromatic hydrocarbon loading in an urban watershed. *Environ Sci Technol*, 44: 1217-1223.

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Coal-tar-based Pavement Sealants – A Potent Source of PAHs

Barbara J. Mahler and Peter C. Van Metre

Pavement sealants are applied to the asphalt pavement of many parking lots, driveways, and even playgrounds in North America (Figure 1), where, when first applied, they render the pavement glossy black and looking like new. Sealant products used commercially in the central, eastern, and northern United States typically are coal-tar-based, whereas those used in the western United States typically are asphalt-based. Although the products look similar, they are chemically different. Coal-tar-based pavement sealants typically are 25-35 percent (by weight) coal tar or coal-tar pitch, materials that are known human carcinogens and that contain high concentrations of polycyclic aromatic hydrocarbons (PAHs) and related chemicals (unless otherwise noted, all

data in this article are from Mahler et al. 2012 and references therein).

PAHs are a large group of organic chemicals created by heating or burning material that contains carbon; 16 PAHs are classified as U.S. Environmental Protection Agency Priority Pollutants, six are classified as probable human carcinogens, and one (benzo[a]pyrene) is classified as a known human carcinogen. The many sources of PAHs to the urban environment span a wide range of PAH concentrations and include tire particles, used motor oil, and diesel and gasoline engine exhaust (Figure 2). Of known urban PAH sources, coal tar and the related compound creosote have the highest PAH concentrations. Coal-tar-based pavement sealant products contain, on average, about 70,000 mg/

kg polycyclic aromatic hydrocarbons (PAHs), on the order of 1,000 times higher than asphalt-based products, which typically contain about 50 mg/kg PAHs.

Pavement sealant is not permanent – the sealant must be reapplied every few years, because it is removed from the pavement by wear and tear from traffic, weathering, and chemical processes. There are at least three ways that pavement sealant (and the PAHs and other chemicals it contains) can leave the pavement surface and enter the surrounding environment: by eroding into small, mobile particles; by dissolving into water; and by volatilizing into air. Where do PAHs derived from sealant go? The answer depends on the process involved. Pavement sealant is worn by vehicle tires into a fine powder that



Figure 1. Pavement sealant is commonly used to seal parking lots, playgrounds, and driveways throughout the United States. Sealants used in the central, northern, eastern, and southern United States typically contain coal tar or coal-tar pitch, both of which are known human carcinogens. Photos by the U.S. Geological Survey.



Figure 2. PAH concentrations in typical urban sources. The concentrations shown are a mean or median from as many as six studies.

is transported by stormwater runoff to streams or lakes, or by wind to adjacent soils or other impervious surfaces. Eroded sealant particles can also stick to shoes and be transported indoors. Some PAHs can dissolve into stormwater, especially just after application, and be transported, along with eroded sealcoat particles, to nearby streams and lakes. PAHs also can be released directly into the atmosphere (volatilization). The high PAH concentrations in coal-tar-based sealant can result in high concentrations of PAHs in a number of environmental settings, with potential adverse effects for human and ecosystem health (see other articles on health and ecosystem effects in this issue).

How can we evaluate whether coal-tar-based sealants are an important source of PAH contamination to the environment? One straightforward way is to compare PAH concentrations in pavement dust, runoff, soil, sediment, house dust, and air on or near coal-tar-sealed pavement with PAH concentrations in those same media on or near unsealed

asphalt pavement or asphalt-sealed asphalt-based sealant (Figure 3).

Pavement Dust and Runoff

The abrasive action of vehicle tires and snowplows grinds dried sealant on the pavement surface into small particles that mix with other dust on the pavement. In southern, central, and eastern U.S. cities, where coal-tar-based sealant use dominates, dust on sealed pavement has about 1,000 times higher concentrations of PAHs than dust on sealed pavement in western U.S. cities, where asphalt-based sealant use dominates (Figure 4). Concentrations of PAHs on pavement with coal-tar-based sealant generally are in the thousands of mg/kg, comparable to concentrations in soils at some Superfund sites. Further, PAH levels in dust on sealed parking lots in the eastern U.S. can be hundreds of times higher than concentrations in dust on unsealed parking lots in the same watersheds. All of these parking lots, sealed and unsealed, share other sources of urban PAHs – vehicle exhaust, leaking motor oil, tire

particles, atmospheric deposition – the only difference is the presence or absence of coal-tar-based sealant.

Pavement dust is mobile – it collects on the pavement surface and at curbs and is readily transported by runoff down storm sewers (Figure 4). When researchers measured PAH concentrations in particles transported by simulated runoff from six coal-tar-sealed parking lots, the mean concentration was 3,500 mg/kg, whereas the mean PAH concentration of particles in runoff from unsealed parking lots (asphalt or concrete) was 54 mg/kg (Mahler et al. 2005). For context, the concentration at which PAH concentrations are expected to harm bottom-dwelling aquatic life is 23 mg/kg.

PAH concentrations in stormwater runoff are highest in the months following sealant application and decrease with time, but even years after application PAH concentrations remain much higher than those in runoff from unsealed pavement, as demonstrated by studies in Wisconsin and New Hampshire. In Madison, WI, the median PAH concentration in unfiltered runoff six years after application of coal-tar sealcoat to a commercial parking lot was 52 $\mu\text{g/L}$, about 20-1000 times higher than concentrations in runoff collected from a minor arterial street, a commercial rooftop, and a residential street (0.05-2.4 $\mu\text{g/L}$). During the three months following application of coal-tar-based sealant to a parking lot at the University of New Hampshire, the mean PAH concentration in unfiltered runoff measured by the University of New Hampshire Stormwater Center (UNHSC) was 1,357 $\mu\text{g/L}$, and decreased over the next two years to a three-month mean of 17-116 $\mu\text{g/L}$ (Figure 5). PAH-contaminated runoff can be acutely and chronically toxic to fish and other aquatic biota, as described in “Toxicity of Coal Tar Pavement Sealant to Aquatic Animals,” page 23 this issue.

In some cases, runoff is collected in a stormwater management device, such as a retention pond, to improve water quality by retaining suspended particles. A study by the UNHSC demonstrated that sediment collected in a stormwater management device draining a coal-tar-sealed parking lot contained 393-1,180 mg/kg PAHs, and sediment collected in a device draining an adjacent unsealed lot contained about 2 mg/kg PAHs. The

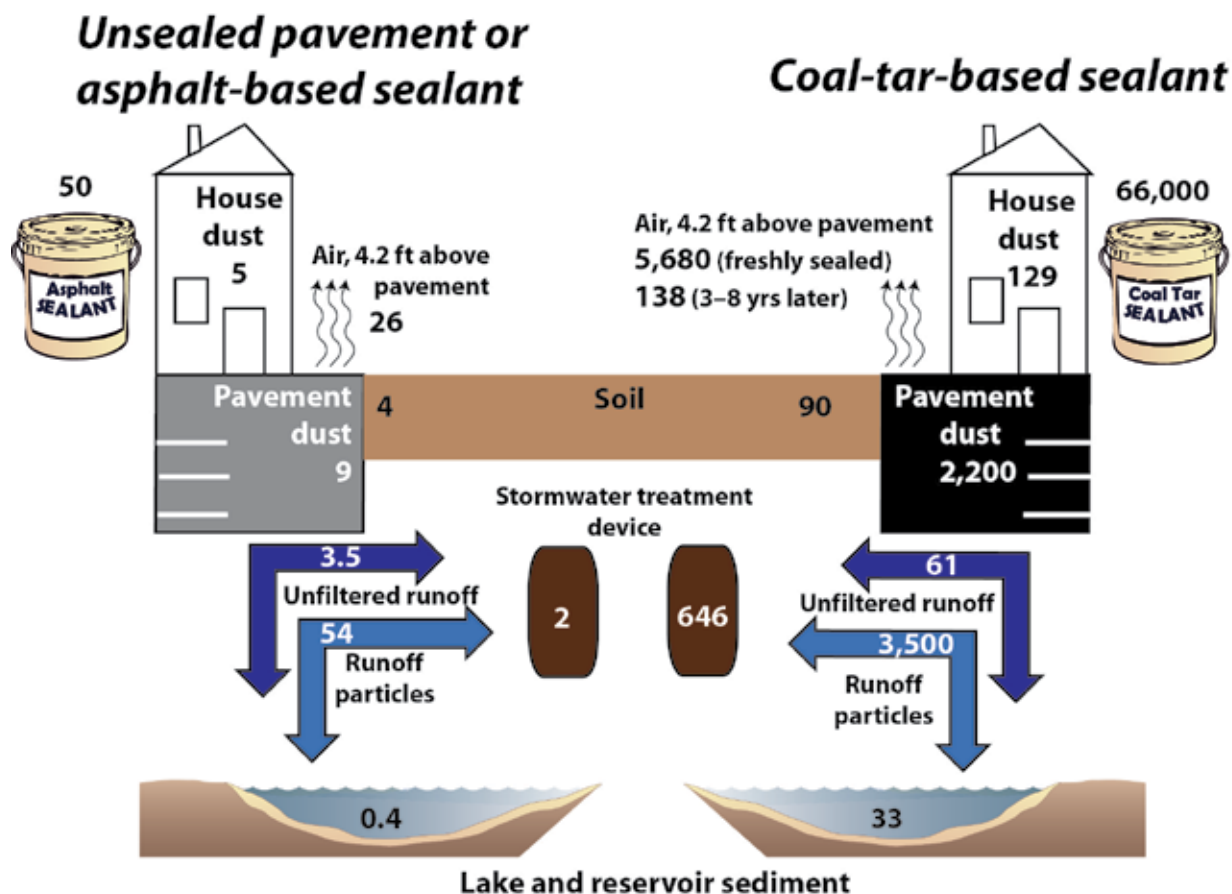


Figure 3. Concentrations of PAHs associated with unsealed or asphalt-sealed pavement (left) are many times lower than those associated with coal-tar-sealed pavement (right). PAHs from sealed pavement are transported to the environment by a variety of pathways, including stormwater runoff to stormwater treatment devices, lakes, and streams; windblown transport to soils; tracking of dried particles indoors; and release by volatilization into air. Humans are exposed to PAHs in pavement dust, soil, house dust, and air; aquatic biota are exposed to PAHs in aquatic sediment, such as in lakes and reservoirs. Concentrations shown are in units of milligrams per kilogram (mg/kg), with the exception of unfiltered runoff ($\mu\text{g/L}$) and air (ng/m^3). Concentration data are from Mahler et al. (2012) (and references therein) or studies cited in this article, and in many cases are the median of multiple studies.

efficient collection of PAH-contaminated sediment in stormwater retention ponds or other devices can have unintended consequences for a municipality because elevated concentrations of PAHs and other contaminants can greatly increase the cost for sediment disposal. Costs for disposing of PAH-contaminated sediment in stormwater ponds in the Minneapolis-St. Paul area are estimated to be \$40–50 per cubic yard, or about \$125,000 per pond, depending on pond size (Judy Crane, Minnesota Pollution Control Agency, written communication, 2015). That translates to an estimated cost of as much as \$1 billion if just ten percent of the ponds in Minnesota contain PAH concentrations that exceed the state's Level 2 human-health risk-based value (Donald Berger, Minnesota Pollution Control Agency, written communication, 2011).

Soil

Contaminated pavement dust can be washed by runoff or blown by wind onto nearby soils. PAH concentrations in soil adjacent to sealcoated pavement in a Chicago, IL, suburb were 23 and 140 mg/kg, 2.3 to 14 times higher than in soil adjacent to unsealed pavement (10 mg/kg) (Van Metre et al. 2009). Composite soil samples from two commercial districts in Fort Worth, TX, where coal-tar sealants were present on some parking lots, had a mean total PAH concentration of about 90 mg/kg, whereas composite soil samples from nearby residential areas, where sealants were not observed, had a mean concentration of about 4 mg/kg (Wilson et al. 2006). Similarly, PAH concentrations in soil adjacent to a coal-tar-sealed parking lot studied by the UNHSC were as high as 411 mg/kg, and decreased with distance from the parking

lot to less than 10 mg/kg. The highest PAH concentrations were measured in soil in areas where snowplows had piled snow containing pavement dust and sealant particles scraped off with the snow during the winter.

Lake and Stream Sediment

PAH-contaminated sediment that is not trapped by stormwater ponds can be transported to streams and lakes. The contribution of coal-tar-based sealant to PAHs in lake sediment can be evaluated by a variety of approaches, including “environmental forensics” (the application of statistical methods to evaluate the chemical content of the source and the sediment), microscopic identification of particles, and land-use analysis. An example of environmental forensics is a comparison of the relative proportions of different PAHs – the “fingerprint”

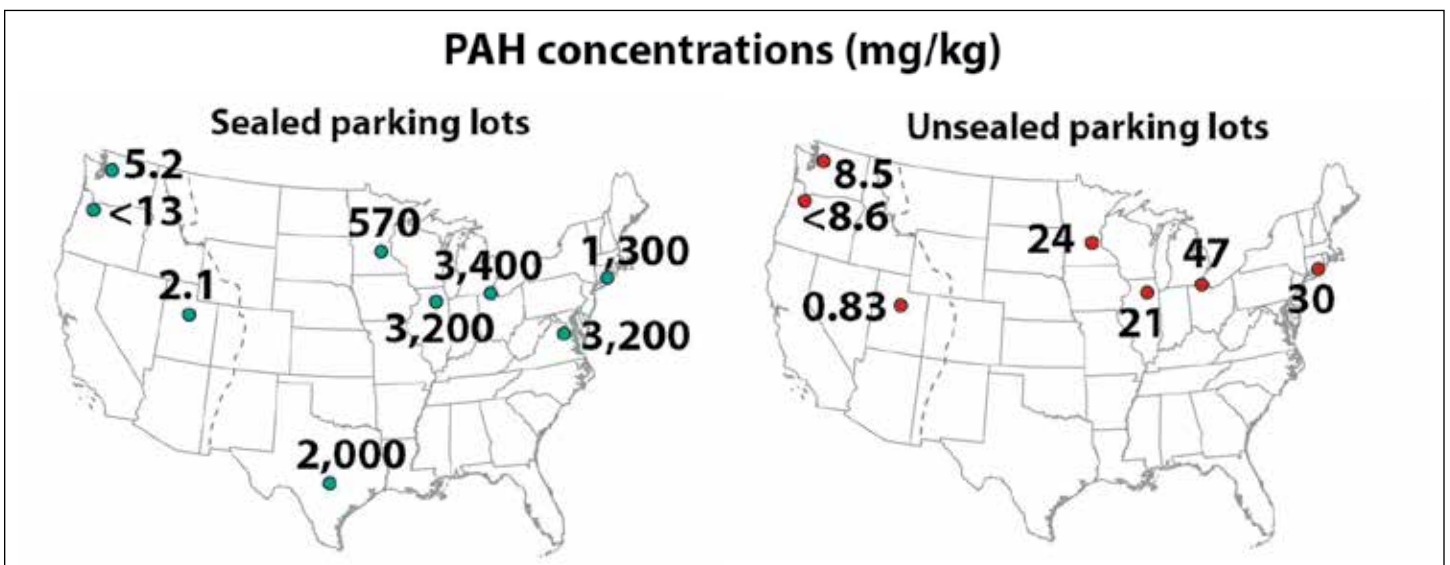


Figure 4. Parking lot “dust” contains abraded sealant (black particles, top). The dust collects on the parking lot surface and along curbs, where it can be carried by runoff down storm drains. PAH concentrations in dust swept from sealed parking lots in the eastern United States, where coal-tar-based sealant is predominantly used, were about 1,000 times higher than in dust from sealed parking lots in the west, where asphalt-based sealant is predominantly used. PAH concentrations in dust on sealed lots in the eastern U.S. also were as much as 100s of times higher than concentrations in dust on unsealed lots in the same watersheds, indicating that the sealant is the principal source of the elevated PAH concentrations (Van Metre et al. 2009). Photo by the U.S. Geological Survey.



Figure 5. Researchers at the University of New Hampshire Stormwater Center simulate runoff on coal-tar-sealed pavement for measurement of polycyclic aromatic hydrocarbons (PAHs). Photo by the University of New Hampshire Stormwater Center.

– in dust collected from parking lots in U.S. cities to fingerprints in sediments from lakes in the same watersheds. For central and eastern U.S. watersheds, the fingerprints of sealed pavement dust and lake sediment were similar, and were different from those in western U.S. watersheds, where the asphalt-based product is used. A more quantitative approach – a statistical method known as source-apportionment modeling – estimated that coal-tar-based sealant contributed about one-half of the PAHs to 40 U.S. urban lakes studied by the U.S. Geological Survey; the other major contributors were vehicles and coal combustion. The topic of PAH sources to lakes and streams is further discussed in “Trends and Sources of PAHs to Urban Lakes & Streams,” page 8 this issue.

House Dust

Coal-tar-based sealant can cause indoor as well as outdoor contamination. Abraded sealant particles can stick to the bottoms of shoes and be tracked indoors, where they become incorporated into

house dust. In a study of 23 ground-floor apartments in Austin, TX, apartments with coal-tar-sealed parking lots had house dust with PAH concentrations that were 25 times higher on average than apartments with parking lots that were unsealed or that were sealed with an asphalt-based product (Figure 3). The study found no relation between PAH concentrations in house dust and other factors such as tobacco smoking, barbecue and fireplace use, and candle and incense-burning.

These results are of concern because ingestion of house dust is well recognized as a pathway for human exposure to chemicals, especially for toddlers, who play on the floor and put their hands and objects into their mouths. This topic is discussed in more detail in “Human Health Concerns Associated with Exposure to PAHs & Coal-Tar-Sealed Pavement,” page 19 this issue.

Air

Some of the PAHs in coal-tar-based sealant are released into air during and after application (Figure 3) through a

process called volatilization. Many PAHs, including the seven classified as probable or known human carcinogens, are volatile to some degree. Airborne PAHs are of concern because inhalation is another important pathway for human exposure. Although unseen, airborne releases of PAHs from freshly applied coal-tar-based sealant are on the order of 45,000 $\mu\text{g}/\text{m}^2/\text{hr}$, which is tens of thousands of times higher than releases from unsealed asphalt. Taken across the entire United States, emissions of PAHs to air from newly applied coal-tar-based sealant are estimated to exceed those from motor vehicles.

The concentrations of PAHs in air above freshly coal-tar-sealcoated pavement decrease rapidly during the weeks following application, but even years later remain several times higher than in air over unsealed pavement (Figure 3). Air at approximate breathing height above coal-tar-sealed pavement (4.2 feet, or 1.28 meters) even in suburban areas contains PAH concentrations that rival or exceed those in highly

industrialized areas. For example, in a study that measured volatilization of PAHs from parking lots that had been treated with coal-tar-based sealant years previously, the mean concentration of the PAH pyrene was about 2-19 times higher than pyrene concentrations measured in air samples from urban industrial sites from New Jersey and Chicago, USA (Van Metre et al. 2012).

A Scientific Consensus

Independent research by scientists and engineers from academic institutions and government agencies demonstrates that coal-tar-based sealant is a potent source of PAHs to water, dust, soil, stream and lake sediment, and air. The comparison of PAH concentrations in settings where coal-tar-based sealant is or is not applied provides an unambiguous picture of the importance of coal-tar-based sealants as a source of PAHs to our urban and suburban environments.

References

MacDonald, D.D., C.G. Ingersoll and T.A. Berger. 2000. Development and

evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. *Arch Environ Contamin Toxicol*, 39:20-31.

Mahler, B.J., P.C. Van Metre, J.L. Crane, A.W. Watts, M. Scoggins and E.S. Williams. 2012. Coal-tar-based pavement sealcoat and PAHs: Implications for the environment, human health, and stormwater management. *Environ Sci Technol*, 56:3039-3045.

Van Metre, P.C., B.J. Mahler and J.T. Wilson. 2009. PAHs underfoot: Contaminated dust from coal-tar sealcoated pavement is widespread in the United States. *Environ Sci Technol*, 43:20-25.

Van Metre, P.C., M.S. Majewski, B.J. Mahler, W.T. Foreman, C.L. Braun, J.T. Wilson and T. Burbank. 2012. Volatilization of polycyclic aromatic hydrocarbons from coal-tar-sealed pavement. *Chemosphere*, 88:1-7.

Wilson, J.T., P.C. Van Metre, C.J. Werth and Y. Yang. 2006. Particle-associated contaminants in street dust, parking lot dust, soil, lake-bottom sediment,

and suspended and streambed sediment, Lake Como and Fosdic Lake watersheds, Fort Worth, Texas, 2004. U.S. Geological Survey Data Series 211, 24 p.

Additional information is available at USGS Research: PAHs and Coal-Tar-Based Pavement Sealcoat, <http://tx.usgs.gov/sealcoat.html>.

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Human Health Concerns Associated with Exposure to PAHs & Coal-Tar-Sealed Pavement

Spencer Williams and William G. Wilber

Whether polycyclic aromatic hydrocarbons (PAHs) and other chemicals in the environment pose a risk to human health depends on the extent to which people are exposed to them. Paracelsus, the 16th century Swiss scientist and founder of modern toxicology was the first to expound on the concept of dose response and its importance in determining whether chemicals pose a risk to human health: “Poison is in everything and no thing is without poison. The dosage makes it either a poison or a remedy.”

Assessing the Risks of Cancer

Exposure to PAHs has been linked to increased risk for lung, bladder, and skin cancers. Coal-tar-based pavement sealants are 15-35 percent coal-tar pitch. Coal tar and coal-tar pitch are listed as Group 1 carcinogens (carcinogenic to humans). PAHs are the major constituents of coal-tar pitch, and commercially available coal-tar-based sealants contain on the order of 50,000-100,000 mg/kg PAHs (sum of the 16 U. S. Environmental Protection Agency [USEPA] priority pollutant PAHs). The USEPA currently classifies the following seven PAH compounds as probable human carcinogens (Group B2): benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenz[a,h]anthracene, and indeno[1,2,3-cd]pyrene. Coal tar itself is a powerful mutagen; having a mutagenicity index that is about 1,000 times that of asphalt cements.

The way the risk of cancer is assessed for these PAHs is still evolving. While confirming that benzo[a]pyrene is carcinogenic to humans, the USEPA recently revised a number that describes the relationship between exposure and the risk of developing cancer (i.e., the

cancer slope factor). Scientists are also re-evaluating the potency of numerous PAHs. The proposed Relative Potency Factor (RPF) for dibenz[a,h]anthracene is 10, whereas its previous value was 1. Also, several more PAHs may be added to the list of substances that are considered carcinogenic; two of these have proposed RPFs of 20 and 60. Without a doubt, these efforts will change our assessment of the risk posed by people living in environments contaminated with coal-tar-based pavement sealants. Considering the number of sites and situations in which people come into contact with PAHs, our understanding of risk and potency of various PAHs will continue to evolve.

Potential Avenues of Exposure

There are numerous potential avenues for exposure to the PAHs in coal-tar-based sealants. These pathways include direct skin contact with the sealant; incidental ingestion of abraded particles from driveways, parking lots, and playgrounds where coal tar sealcoat has been used; from nearby soils; household dust inside homes adjacent to sealed pavement; and inhalation of PAHs that emanate from asphalt surfaces after sealcoat has been applied (Figure 1).

Although coal-tar-based sealcoat has been on the market since at least 1960, there are few published studies about the contribution of sealcoat to PAH exposures



Figure 1. Incidental ingestion of abraded particles and skin contact are two ways humans can be exposed to PAHs. Parking lots and driveways with coal-tar-based sealcoat have concentrations of PAHs hundreds to thousands of times higher than those with asphalt based sealcoat or no sealcoat. Photo: ©HalfPoint; used under license from Shutterstock®.

and the associated potential for adverse human-health outcomes. Most of the information that is available to evaluate the potential for human health effects consists of data on the concentrations of specific PAH compounds and laboratory toxicity studies.

Exposure to PAHs in Soils and House Dust

In 2008, a study of 23 apartments in Austin, Texas, found that house dust adjacent to coal-tar-sealed parking lots contain concentrations of PAHs 25 times higher on average than house dust collected from apartments near unsealed or asphalt-sealed parking lots. The presence or absence of coal-tar-based sealcoat on the parking lot of the apartment complex was strongly correlated with PAH concentrations in house dust. Although tobacco smoking, candle burning, and barbecue and fireplace use are also potential sources of PAHs in house dust, the research scientists could not attribute the PAH concentrations in the house dust to any of these other sources. The potential for exposure to high concentrations of PAHs in soils and house dust is particularly important for young children who typically spend more time crawling and playing on floors and are prone to hand-to-mouth behaviors that make them more likely to be exposed than older children and adults. This is a similar pathway that makes children susceptible to contact with lead in their environments, either from deteriorating lead-based paint or contaminated soil (Figure 2).

There are no U.S. health-based guidelines for exposure to PAHs in house dust. The only existing guideline is for a single PAH – benzo[a]pyrene – issued by the German Federal Environment Agency Indoor Air Hygiene Commission. The guideline advises minimizing exposure to concentrations of benzo[a]pyrene greater than 10 milligrams per kilogram in dust to avoid adverse health effects. In the Austin, TX study, that guideline was exceeded for 4 of the 11 apartments adjacent to parking lots covered with coal-tar sealcoat and for one of the 12 apartments with a parking lot with a different surface type. Also possibly of concern is contact with sealcoated pavement surfaces themselves through play activities. Dust on some of the parking lots covered with coal-tar sealcoat



Figure 2. The potential for exposure to high concentrations of PAHs in soils and house dust is particularly important for young children, who spend more time crawling and playing on floors and are prone to hand-to-mouth behaviors that make them more likely to be exposed than older children and adults. Photo: ©Marko Poplasen; used under license from Shutterstock®.

had a concentration of benzo[a]pyrene that was more than 50 times higher than the German guideline.

Building on the findings from the 2008 household dust study in Austin, Texas, researchers examined the potential human health effects from incidental ingestion of the PAHs from household dust and soil under several scenarios. One scenario estimated the risks of exposure over the first six years of a child's life, and another examined risks associated with a lifetime of exposure to that environment. In 2012, the authors reported that children living in homes adjacent to pavement with coal-tar-based sealcoat are likely to be exposed to doses of PAHs that are about 14-fold higher than children living in residences adjacent to unsealed pavement, through ingestion of house dust. The scientists concluded that the presence of coal-tar-based pavement sealants is associated with an increase in estimated excess lifetime cancer risk for nearby residents and that much of this calculated excess risk was attributed to exposures to PAHs in early childhood, up to six years of age.

While many of the choices made by the authors in the risk assessment result in conservative (lower) estimates of risk;

given the inherent uncertainty associated with doing risk analysis with relatively small data sets, the authors point to a need for biomonitoring and/or other additional research to better characterize exposure patterns to children and adults.

In 2016, researchers at Oregon State University (OSU) published results from new laboratory analytical procedures that enabled them to analyze for a larger number of PAH compounds in sealcoat. The authors detected several substances in coal-tar sealants that have not previously been analyzed in this product, one of which is projected to be 30 times more potentially carcinogenic than benzo[a]pyrene. The OSU study also showed that including new PAH compounds found in coal-tar sealcoats increased the equivalent dose of carcinogenic PAHs by 4 percent to 40 percent, using the proposed RPFs. By contrast, the study showed that compounds from asphalt-based sealcoat (more commonly used in the Western U.S.) were far less hazardous than coal-tar-based sealcoat.

Exposure to PAHs in Urban Streams and Lakes

Research has shown that coal-tar sealcoat use accounts for as much as one-

half to 90 percent of the PAHs in urban streams, lakes, and stormwater ponds. Exposure to PAHs from swimming and other contact recreation in streams and lakes is generally not considered to pose a human health risk because most of the compounds of concern usually associate with sediment where the exposure is typically low and infrequent. Potential risks associated with other forms of dermal contact, for example, when children are playing on sealed surfaces or in soil has not been investigated.

Exposure to Volatile PAHs from Asphalt Surfaces

In addition to exposure of PAHs from particles and dust that abrades from pavement coated with sealcoat, individuals can be exposed to several lower molecular weight PAHs in coal-tar-based sealcoat that are volatile and emanate from asphalt surfaces after sealcoat is applied. The volatile characteristics of these compounds, including naphthalene (the key ingredient in mothballs) is why freshly sealed

parking lots and driveways frequently give off a strong smell (Figures 3). A recent study that compared measured concentrations of PAHs in the air above parking lots with and without coal-tar based sealcoat found that concentrations of eight PAHs were, on average, 60 times higher than concentrations above unsealed pavement, even though the sealants were applied 3 to >8 years before the study. A second study found that the total amount of eight PAH compounds in air just after sealcoat application was about 5,000 times higher than the amount above unsealed parking lots and that one quarter to one half of the PAHs in the applied sealcoat volatilized during the first 16 days following application. The amounts suggest that PAH emissions from new applications of coal-tar based sealant each year are larger than vehicle emissions of PAHs for the United States. Risks associated with exposures to these compounds has yet to be studied, though any such contact would be expected to be greatest for professional applicators of sealcoat products and relatively low for others).



Figure 3. Individuals can be exposed to several lower molecular weight PAHs in coal-tar-based sealcoat that are volatile and emanate from asphalt surfaces after sealcoat is applied. Risks associated with exposures to these compounds has yet to be studied, though any such contact would be expected to be greatest for professional applicators of sealcoat products and relatively low for others. Photo: Peter Van Metre.

Restrictions on Use of Coal-Tar Sealants

Based on the numerous scientific publications that detail environmental contamination and the potential for adverse health effects, two states and several counties and cities have banned the use of coal-tar based sealants in their jurisdictions. These jurisdictions are listed in the frequently asked questions later in this issue. In summer 2016, EPA proposed a rule that industrial facilities that use coal-tar-based pavement sealants will not be able to register for a stormwater permit. In November 2016, the American Medical Association adopted a new policy aimed at reducing or ending the use of common coal-tar-based sealcoats that are used and applied on pavement and playgrounds across the country. The new policy advocates for legislation either to ban the use of pavement sealcoats containing polycyclic aromatic hydrocarbons (PAH) or to mandate the use of sealcoat products with minimal PAH concentrations.

References

- Agency for Toxic Substances and Disease Registry, Toxicological profile for polycyclic aromatic hydrocarbons. Atlanta, GA, U.S. Department of Health and Human Services, Public Health Service 1995.
- Titaley, I.A., A. Chlebowski, L. Truong, R.L. Tanguay and S.L. Massey Simonich. 2016. Identification and toxicological evaluation of unsubstituted PAHs and novel PAH derivatives in pavement sealcoat products. *Environ Sci Technol Letters*, 3 (16): 234-242.
- USEPA. 2017. Toxicological review of benzo[a]pyrene. Integrated Risk Information System (IRIS), Office of Research and Development, U.S. Environmental Protection Agency. Washington, D.C. https://cfpub.epa.gov/ncea/iris/iris_documents/documents/subst/0136_summary.pdf
- USEPA. 2010. Development of a relative potency factor (RPF) approach for polycyclic aromatic hydrocarbons. Integrated Risk Information System (IRIS), Office of Research and Development, U.S. Environmental Protection Agency. Washington, D.C. http://ofmpub.epa.gov/eims/eimscomm.getfile?p_download_id=494851

Van Metre, P.C., M.S. Majewski, B.J. Mahler, W.T. Foreman, C.L. Braun, J.T. Wilson and T.L. Burbank. 2012. Volatilization of polycyclic aromatic hydrocarbons from coal-tar-sealed pavement. *Chemosphere*, 88(1): 1-7.

Van Metre, P.C., M.S. Majewski, B.J. Mahler, W.T. Foreman, C.L. Braun, J.T. Wilson, and T.L. Burbank. 2012. PAH volatilization following application of coal-tar-sealed pavement: *Atmospheric Environ*, 51, 108-115.

Williams, E. S., B.J. Mahler and P.C. Van Metre. 2013. Cancer risk from incidental ingestion exposures to PAHs associated with coal-tar-sealed pavement. *Environ Sci Technol*, 47: 1101-1109.

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Toxicity of Coal-Tar Pavement Sealant to Aquatic Animals

Jenifer McIntyre

In 2010, residents of Boone, North Carolina, called their fire department to report the unusual smell of mothballs in the air. Nearby, officials found that dead crayfish and trout littered Hodges Creek. Naphthalene is the volatile chemical that gives mothballs their particular smell; it belongs to a group of chemicals called polycyclic aromatic hydrocarbons (PAH). What was the sudden source of the naphthalene and was it tied to the fish kill? It turns out that a parking lot with a storm drain to Hodges Creek had been treated with coal-tar sealant just prior to a large rainstorm, which had flushed much of the sealant into Hodges Creek. This creek is located in a highly urbanized area with multiple potential sources of toxic chemical inputs. However, the sudden and complete die-off of resident fish and invertebrates for 1.5 miles downstream of the parking lot following the rain event does not leave much doubt as to the cause. Applicators avoid applying sealcoat prior to rain, but this unfortunate event highlights the toxic potential of coal-tar sealcoats to aquatic animals.

What is Coal Tar?

As described in earlier articles of this volume, coal tar is a byproduct from processing coal, mainly for the steel industry. Coal-tar pitch is the sludge left over after further refinement of coal tar by distillation. These coal products have many uses in industry and manufacturing. Coal tar is sometimes used topically to treat skin conditions such as psoriasis and dandruff, and was the original source of the analgesic drug acetaminophen! Coal tar or coal-tar pitch is the main ingredient in most coal-tar-based pavement sealants. Chemically, coal tar and coal-tar pitches are a complex mixture of hydrocarbons

– many of which are PAHs and related compounds. Coal-tar-based sealants are predominantly used in the central, eastern, northern, and southern U.S. Asphalt-based pavement sealants – used predominantly in the western U.S. – contain many of the same chemicals, but at much lower concentrations (approximately 1,000 times less). Coal tar and its distillates are known human carcinogens.

Toxicity of PAHs

Many of the aromatic hydrocarbons in coal tar and coal-tar pitch are carcinogenic, and can cause mutations, birth defects, and even death. Additionally, many PAHs are phototoxic – that is, toxicity is substantially increased when exposed to the ultraviolet radiation (UV) in sunlight. In humans, this is relevant to topical applications such as treatment for skin conditions, and unintentional skin exposure – for example, workers at foundries and coal tar or tar roofing applicators.

In addition to being toxic to humans, many of the PAHs and related compounds that leach from coal-tar sealcoat are also toxic to aquatic animals, including fish and aquatic invertebrates. Scientists describe toxicity in a number of different ways. One way is to determine whether the toxic effect occurs after a brief exposure (hours to days = acute) or after a longer exposure (weeks/months/years = chronic). The 2010 fish kill in Hodges Creek after the accidental wash-off of coal-tar sealant is an example of an acute effect because the mortality occurred after just a few hours. Cancer is an example of a toxic effect resulting from chronic exposure. This is because the cellular injuries that ultimately cause cancer take time to build up.

Another way to assess toxicity is whether the effects are lethal or sublethal. Lethal effects are those that result in mortality (death) of the organism. Sublethal effects impair or harm the organism in some measurable way, but do not directly kill it. For example, fish embryos exposed to low levels of the PAH phenanthrene develop eyes with shorter retinas and smaller lenses, which impairs their vision. Importantly, sublethal effects can indirectly cause mortality. For example, impaired vision is a sublethal effect, but it can hinder important behaviors like feeding and predator avoidance – indirectly leading to the death of the fish in the wild.

PAHs also include many chemicals that are “cardiotoxic” – affecting heart development and/or function. For example, fish embryos exposed to PAH mixtures develop subtly misshaped hearts that cannot pump as much blood as normal hearts. This in turn results in poorer swimming performance that affects the ability of fish to survive and thrive in the wild. Further, through all developmental stages, some PAHs can directly impair heart function by blocking potassium channels in heart muscle cells, which causes arrhythmia. A final important concept of toxicology is that “the dose makes the poison.” Typically, stronger effects occur at higher concentrations and/or longer exposure durations. Therefore, a compound that causes sublethal effects at one concentration may be lethal at a higher concentration and/or longer exposure time. For example, if the PAH exposure continues for hours, the cardiac arrhythmias from blocked potassium channels in cardiac muscle cells can be fatal.

PAHs in Coal-Tar Sealcoat

The PAHs and similar contaminants in coal-tar sealant can come into contact with aquatic animals through a number of exposure routes. They can be dissolved directly from the sealant surface or from tiny eroded particles of sealant. This means that water simply passing over a coal-tar-sealed surface will pick up toxic contaminants. Larger particles – often “flakes” – of sealcoat that are worn from the sealcoated surface wash into streams and lakes where they are incorporated into the sediment. Aquatic animals can ingest those particles, in which case the contaminants are released and become ‘bio-available’ inside the animal’s gut. The larger particles also provide a long-term source of contaminants that can be leached off of the particle. Coal-tar-sealed pavements are the largest source of PAHs to streams in areas that commonly use this type of sealant. Several studies, using a variety of methods, have demonstrated the link between use of coal-tar-based pavement sealants and PAHs in aquatic sediments. This topic is further discussed in “Trends and Sources of PAHs to Urban Lake & Streams,” page 8 in this issue.

Environmental scientists have documented toxicity to aquatic animals from different types of exposure to coal-tar sealant. In some studies, water is applied to a sealcoated surface to simulate stormwater runoff (Figure 1) and the runoff is tested immediately for toxicity to aquatic animals. In these studies, the test organisms (fish or aquatic invertebrates) typically are exposed to the water for a short duration (days). These exposures measure “acute” impacts. Many of the studies have investigated how the toxicity of runoff changes as the sealant ages, or “weathers,” over months to years. In other studies, flakes of dried sealcoat are added to water or to clean stream sediment prior to adding aquatic animals. In these studies, the test organisms are typically exposed to the water or sediment for a longer duration (weeks), measuring impacts from “chronic” exposure.

Toxicity to Aquatic Animals from Acute Exposure

Runoff water collected within hours of coal-tar sealcoat drying is consistently lethal to fish and aquatic invertebrates (Table 1). This is because of the high



Figure 1. Coal-tar sealant application (A) and a sprinkler system to simulate rain on coal-tar-sealed pavement at Washington State University (B).

concentrations of contaminants that dissolve into runoff water after the sealcoat is first applied. Concentrations of some contaminants (e.g., the PAH phenanthrene; Figure 2) decrease rapidly over the first few days following application, but runoff waters continue to be toxic for a surprisingly long time. A study in Texas collected water from parking spaces with coal-tar sealcoat

applied. Runoff water was generated at intervals between 5 hours and 111 days after sealant application. Daphnia – tiny hard-shelled aquatic invertebrates – and juvenile fathead minnows were placed in these waters and their survival monitored for 48 hours. The researchers saw 100 percent mortality even 36 days after the sealant was applied. For coal-tar-sealed plots 36 to 111 days old, the daphnia

Table 1. Studies of the Toxicity of Coal-Tar Sealant to Aquatic Animals.

Organisms	Tissue	Exposure Duration	Time since sealcoat application	Coal-tar sealant source	Sediment Σ PAH (mg/kg) ^a	Water Σ PAH (μ g/L)	Toxic Effect	UV ^b or other treatment
<i>Daphnia magna</i> and fathead minnow (<i>Pimephales promelas</i>)	Whole	48 h	5 h – 36 d	Runoff water	n.a.	167-367	100% dead	UV: 100% dead
<i>Daphnia magna</i> and fathead minnow (<i>Pimephales promelas</i>)	Whole	48 h	68 - 111 d	Runoff water	n.a.	167-367	<20% dead	UV: 100% dead
Zebrafish embryos (<i>Danio rerio</i>)	Whole	48 h	2 h	Runoff water	n.a.	1040	100% dead	
Zebrafish embryos (<i>D. rerio</i>)	Whole	48 h	7 - 207 d	Runoff water	n.a.	137-164	>60% hearts abnormal	Unsealed: no effect
Rainbow trout (<i>Oncorhynchus mykiss</i>)	Liver cells	48 h	5 h – 36 d	Runoff water	n.a.	1.7-36	1%, 10% runoff: no DNA damage	UV: 1%, 10% runoff: DNA damage
Juvenile salmon (<i>Oncorhynchus kistutch</i>)	Whole	96 h	2 h	Runoff water	n.a.	1040	100% dead	
Juvenile salmon (<i>O. kisutch</i>)	Whole	96 h	7 - 207 d	Runoff water	n.a.	137-164	10-55% dead	^c Unsealed: no effect
Medaka embryos (<i>Oryzias latipes</i>)	Whole	9 d	1-2.5 years	Runoff water ^d	n.a.	n.m.	23% dead, DNA damage	UV: No additional DNA damage
Frog embryo (<i>Xenopus laevis</i>)	Whole	10 d	n.a.	Dried flakes in water	n.a.	1310 mg flake/L	100% dead	Not tested
Midge (<i>Chironomus dilutes</i>)	Whole	10 d	unknown	Parking lots	0.6-208 ^e median: 33	n.m.	Reduced mass	
Newt (<i>Nothophthalmus viridescens</i>)	Whole	28 d	n.a.	Dried flakes in sediment	8-1149 median: 57	160-1464	Liver damage, impaired righting behavior	Asphalt sealcoat flakes: no effect
Salamander (<i>Ambystomas maculatus</i>)	Whole	28 d	n.a.	Dried flakes in sediment	48-1360	66-263	Impaired swimming	UV: blood cell changes
Amphipod (<i>Hyallela Azteca</i>)	Whole	28 d	unknown	Parking lots	0.6-208 ^e median: 33	n.m.	Reduced mass	UV: 31% sites increased death; 69% sites immobility
Benthic macroinvertebrates	Community	24 d	n.a.	Dried flakes in sediment	5.8-324 median: 11		Altered	
Benthic macroinvertebrates	Community	Field	unknown	Parking lots	0.7-32 ^f median: 7	n.m.	Less richness and density as sediment PAHs increased	
Frog embryo (<i>Xenopus laevis</i>)	Whole	52 d	n.a.	Dried flakes in water	n.a.	15,131 mg flake/L	Developmental delay	

^a dried sediment weight^b UV following water exposure^c exposure to runoff from u sealed pavement^d runoff in retention pond at least 7 days old^e sediments from 33 streams^f downstream of input from parking lots at 5 sites

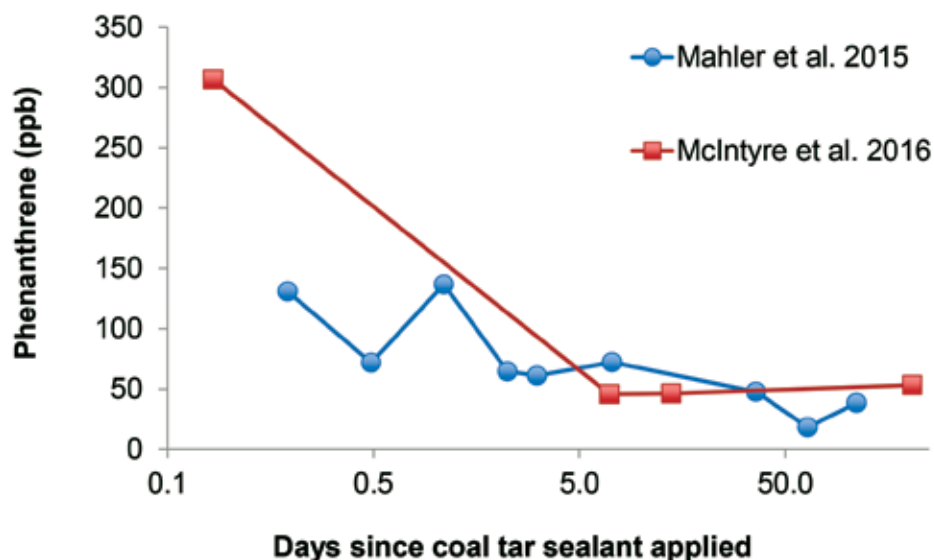


Figure 2. Decrease in the PAH phenanthrene in runoff water over time after coal-tar sealcoat application. Data from Mahler et al. 2015 and McIntyre et al. 2016.

and minnows placed in runoff water survived – unless they were exposed briefly to UV radiation at the end of the 48-hour monitoring period, in which case they all died. This was true even for runoff water diluted 1:10. In contrast, runoff from a mixed coal-tar and asphalt-based sealcoat was toxic to the animals only if they also got a dose of UV. In daphnia, runoff from the asphalt-based sealant was phototoxic for 36 days after sealant application, but for minnows the phototoxicity of the coal tar + asphalt sealant lasted less than one week after sealcoat application.

A study in Washington tested runoff water from pavement sealed with coal tar on juvenile salmon (*Oncorhynchus kisutch*) and the developing embryos of zebrafish (*Danio rerio*). Toxicity remained high enough seven months after sealant application for runoff to kill 55 percent of juvenile salmon within 96 hours. The bile of surviving salmon was black instead of a healthy pale green (Figure 3), indicating that the fish were actively metabolizing the coal-tar chemicals. Runoff from the seven-month-old sealcoat also caused cardiovascular abnormalities in more than 60 percent of developing zebrafish embryos within 48 h (Figure 4). In contrast, unsealed pavement from an adjacent plot did not cause any mortality or sublethal toxicity in either species over the exposure time. Acute toxic effects were also seen in frog embryos (*Xenopus laevis*) reared in water containing coal-tar sealant flakes. All of the embryos exposed to the highest dose of flakes (1,301 mg/L) died within ten days (Table 1), even though the contaminated water was replaced with fresh water daily.

Finally, a study with Japanese killifish embryos (*Oryzias latipes*) tested water sampled from a detention pond receiving runoff from a parking lot sealed with coal tar. Approximately one year after the sealcoat was applied, the pond water killed 17 percent of killifish embryos within 9 d of exposure. Approximately 2.5 years after the sealcoat was applied, embryos exposed to the pond water showed significant damage to their

DNA. It is important to note that many of the contaminants in coal-tar sealant, including PAHs, are “organic” chemicals. This refers to the fact that they are made up of carbon and hydrogen and as such can be degraded by bacteria. The result is that, typically, these chemicals will lose potency over time once they are dissolved in natural waters. This is an important study not only because the sealcoat itself was older, but also because the water used in these experiments was collected from the retention pond more than one week after the most recent rainfall. As such, there would have been significant degradation of the chemicals carried from the parking lot into the pond.

Toxicity to Aquatic Animals from Longer Exposures

Several studies have added flakes of coal-tar sealant into clean water or

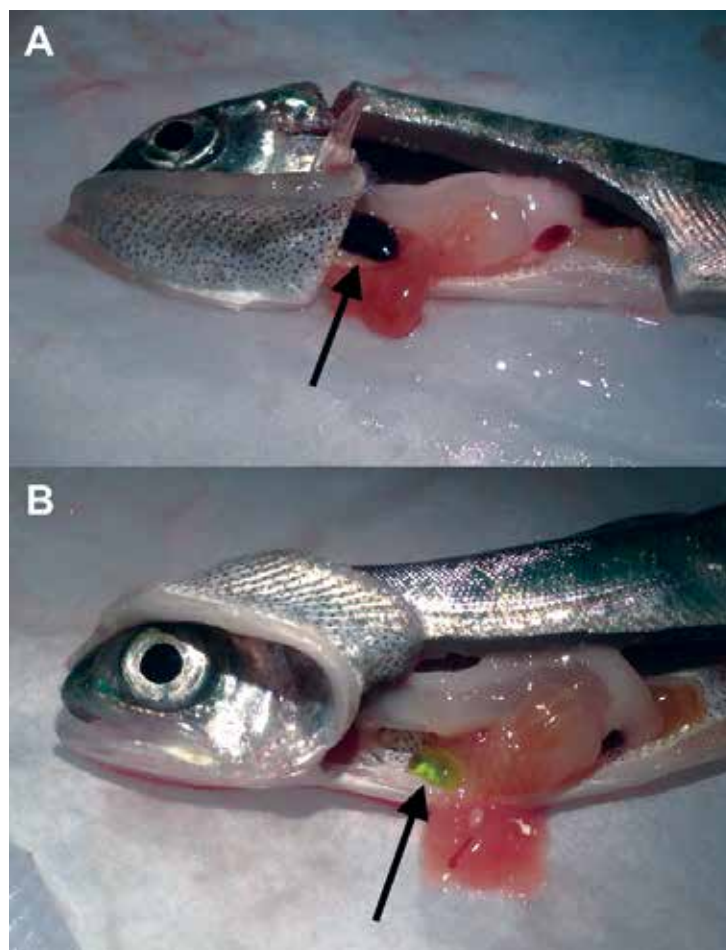


Figure 3. Bile from the liver is excreted into the intestines for removal from the body. Gallbladder containing bile is indicated by a black arrow. (A) The bile of salmon surviving exposure to runoff from coal-tar sealcoat was black. (B) The bile of control salmon and salmon exposed to runoff from unsealed pavement was a healthy pale green.

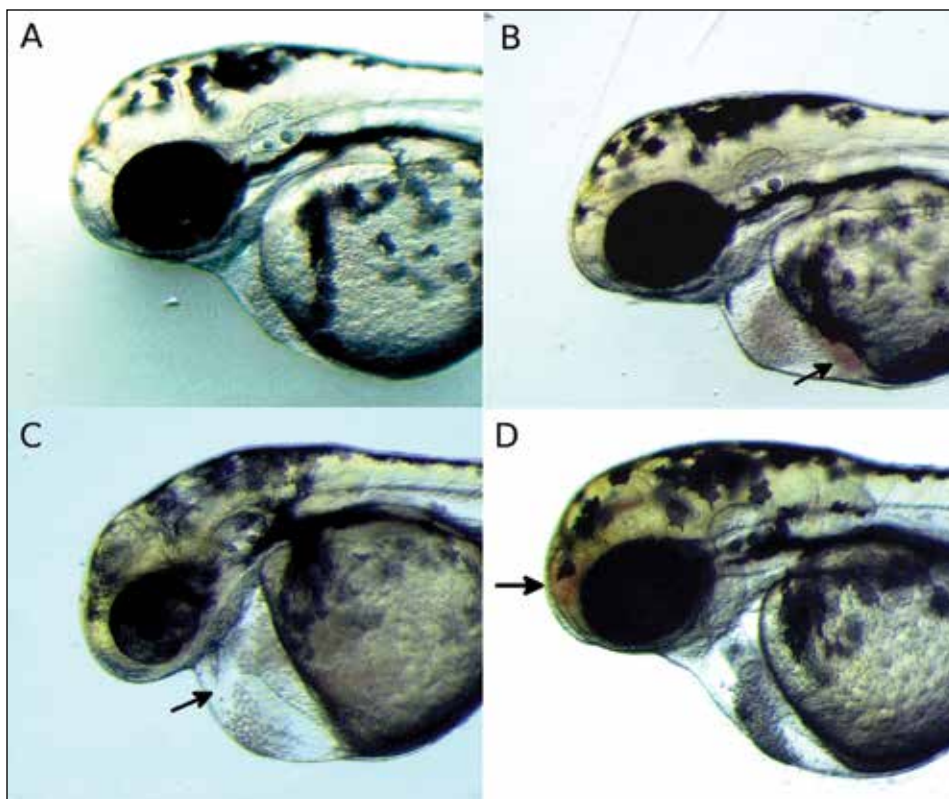


Figure 4. Zebrafish embryos following exposure to (A) control water or (B-D) runoff from coal tar sealcoated pavement showing various cardiovascular abnormalities. (A) Normally developed embryo. (B) Blood pooling in the common cardinal vein. (C) Pericardial edema – fluid accumulation around the heart. (D) Cranial hemorrhaging from broken blood vessels in the head.

sediments and studied the chronic (weeks) toxicity to aquatic vertebrates including frogs, newts, and salamanders (Table 1). Frog embryos exposed to dried coal-tar sealant flakes in water at medium (131 mg/L) and low (15 mg/L) doses survived the full exposure of 52 days, but by 14 days, the embryos had significant developmental delay. By 52 days, 66 percent of the control tadpoles had metamorphosed into frogs, but none of those exposed to either the low or medium doses reached metamorphosis. Eastern newts (*Notophthalmus viridescens*) showed evidence of liver damage after 28 days associated with sediments containing coal-tar sealant flakes. The amount of liver damage was related to the amount of PAHs that dissolved in the water. Similarly, salamanders (*Ambystoma maculatum*) exposed to sediment with coal-tar sealant flakes had impaired swimming ability. However, exposure to flakes of asphalt-based sealcoat produced much lower levels of dissolved PAHs and did not cause measurable impairment.

Many aquatic invertebrates are closely associated with sediments. These “benthic” invertebrates include families like amphipods that spend their whole lives in or near the sediments, while others like midges or mayflies eventually emerge from water and metamorphose into flying insects. During their benthic phase, these invertebrates are especially vulnerable to particles from coal-tar sealant. Changes in entire benthic invertebrate community composition have been observed when exposed to clean sediments with added flakes of coal-tar sealcoat. Furthermore, in streams receiving runoff from parking lots with coal-tar sealant scientists have observed a clear negative relationship between concentration of PAHs in sediments and the number and diversity of aquatic invertebrates. The most recent study on the toxicity of coal-tar sealant to aquatic invertebrates used sediment collected from streambeds at 33 sites around Milwaukee, WI. A midge species (*Chironomus dilutus*) was reared with the Milwaukee sediments for 10 days and an amphipod (*Hyalella azteca*) for 28

days. There was no significant mortality for either species, but the animals lost weight when exposed to sediments from 19 percent of the sites. Following a four-hour UV exposure, *H. azteca* survival was reduced at 1/3 (31 percent) of sites, and mobility was impaired at 2/3 (69 percent) of sites. PAH concentrations at nearly all of these sites (91 percent) had PAH concentrations above the sediment quality guideline (probable effect concentration) of 22.8 mg PAH/kg sediment, the concentration at which negative effects to benthic animals are likely.

Is Phototoxicity Relevant to Aquatic Animals?

Some have argued that UV-induced phototoxicity of PAHs is not relevant to animals living underwater, because UV radiation dissipates with depth. However, many of the streams where animals are exposed to sediments with elevated PAHs are shallow and the water is typically clear – making the laboratory exposures similar to actual conditions in the wild. Additionally, many aquatic animals and/or their embryos are translucent or clear, which increases their vulnerability to phototoxic PAHs.

Summary

Healthy ecosystems provide economic and health benefits to humans. Ecosystems made unhealthy by chemical pollution do more than deny us these benefits – they are mirrors that link our welfare to that of other animals. Numerous research studies show that toxic chemicals from coal-tar sealcoats can cause a suite of toxic injuries in a variety of invertebrates, amphibians, and fish. These injuries include mortality as well as sublethal effects such as DNA damage, cardiotoxicity, developmental delay, and alterations of critical behaviors. In contrast there appears to be relatively little toxicity associated with unsealed pavements or pavements sealed with asphalt-based products. Finally, sunlight can exacerbate the toxic effects of exposure to PAHs, particularly for animals living in shallow water. In response to the 2010 fish kill on Hodges Creek mentioned in the introduction to this article, council members of Boone, North Carolina, passed strict regulations to discourage the use of coal-tar-based products as

pavement sealers. Similar and even more stringent regulations have been enacted elsewhere in the U.S. in recognition of the risks that these sealants pose to human and non-human health.

References

- Baldwin, A.K., S.R. Corsi, M.A. Lutz, C.G. Ingersoll, R. Dorman, C. Magruder and M. Magruder. 2016. Primary sources and toxicity of PAHs in Milwaukee-area streambed sediment. *Environ Toxicol Chem*, DOI: 10.1002/etc.3694
- Bommarito, T., D.W. Sparling and R.S. Halbrook. 2010. Toxicity of coal-tar and asphalt sealants to eastern newts, *Notophthalmus viridescens*. *Chemosphere*, 81(2): 187.
- Bommarito, T., D.W. Sparling and R.S. Halbrook. 2010. Toxicity of coal-tar pavement sealants and ultraviolet radiation to *Ambystoma maculatum*. *Ecotoxicology*, 19(6): 1147.
- Bryer, P.J., J.N. Elliott and E.J. Willingham. 2006. The effects of coal tar based pavement sealer on amphibian development and metamorphosis. *Ecotoxicology*, 15(3): 241.
- Bryer, P.J., M. Scoggins and N.L. McClintock. 2010. Coal-tar based pavement sealant toxicity to freshwater macroinvertebrates. *Environ Pollut*, 158(5): 1932.
- Colton, M.D., K.W.H. Kwok, J.A. Brandon, I.H. Warren, I.T. Ryde, E.M. Cooper, D.E. Hinton, D. Rittschof and J.N. Meyer. 2014. Developmental toxicity and DNA damage from exposure to parking lot runoff retention pond samples in the Japanese medaka (*Oryzias latipes*). *Marine Environ Res*, 99: 117.
- Kienzler, A., B.J. Mahler, P.C. Van Metre, N. Schweigert, A. Devaux and S. Bony. 2015. Exposure to runoff from coal-tar-sealed pavement induces genotoxicity and impairment of DNA repair capacity in the RTL-W1 fish liver cell line. *Sci Total Environ*, 520: 73.
- Mahler, B.J., C.G. Ingersoll, P.C. Van Metre, J.L. Kunz and E.E. Little. 2015. Acute toxicity of runoff from sealcoated pavement to *Ceriodaphnia dubia* and *Pimephales promelas*. *Environ Sci Technol*, 49(8): 5060.
- McIntyre, J.K., R.C. Edmunds, B.F. Anulacion, J.W. Davis, J. Incardona, J.D. Stark and N. Scholz. 2016. Severe coal tar runoff toxicity to fish and reversal by bioretention filtration. *Environ Sci Technol*, 50(3): 1570.
- Scoggins, M., N.L. McClintock, L. Gosselink and P. Bryer. 2007. Occurrence of polycyclic aromatic hydrocarbons below coal-tar-sealed parking lots and effects on stream benthic macroinvertebrate communities. *J N Am Benthol Soc*, 26(4): 694.

Dr. Jenifer McIntyre is an assistant professor of aquatic toxicology at Washington State University in Puyallup, WA. Her major research goals include understanding the impacts to aquatic animals of contaminants present in urban stormwater runoff, and the biological effectiveness of green stormwater infrastructure to prevent those impacts.



(Student Corner, continued from p. 39 . . .)

Andrew Labaj, M.Sc., is currently pursuing a Ph.D. in biology at Queen's University, Ontario, Canada in the Paleocological Environmental Assessment and Research Laboratory (PEARL). His M.Sc. work used paleolimnology to assess the biological recovery of lakes surrounding Sudbury, Ontario. Andrew's current research uses paleolimnology to examine the impacts of climate change in the high-elevation lakes of the South American Andes.



Branaavan Sivarajah, M.Sc., is currently pursuing his doctoral research with PEARL at Queen's University, Ontario, Canada. For his M.Sc. project, Branaavan used paleolimnological techniques to examine the cumulative effects of multiple stressors on aquatic ecosystems around Georgian Bay, Lake Huron, including acidified lakes in Killarney Provincial Park near Sudbury, Ontario. Branaavan's current research focuses on assessing the long-term biological consequences of arsenic contamination in subarctic lakes from Yellowknife, Northwest Territories.



The Host Committee is busy working on the details for the 37th annual Symposium. Potential highlights include nature photography workshop, new aeration/oxygenation workshop, field trip to Lake Dillon, factory tours for local probe manufactures, and a visit to the USGS ice core laboratory.

Protecting Urban Waters & Sediments in Minnesota & the Great Lakes Region

Al Innes*

Recent action to reduce PAHs from coal-tar sealcoats to protect urban waters and sediments in Minnesota and the Great Lakes region

Background

Since its establishment in 1990, Minnesota's Toxic Pollution Prevention Program approach has been applied broadly to an array of existing and emerging environmental issues in addition to toxic waste including inefficiencies in energy and water use. Addressing environmental issues where they originate, before there is an impact, has helped improve companies' net profits, while helping to improve health, environment, and sustainability of natural resources.

In recent years, environmental monitoring and research has detected the presence of existing as well as new and emerging contaminants in people and the environment that are released during or after the use of a product, including plastics monomers, plasticizers, surfactants, flame retardants, fragrances, corrosion inhibitors, pigments, pharmaceuticals, and polycyclic aromatic hydrocarbons (PAHs). In response, the Minnesota Pollution Control Agency (MPCA) has used the prevention approach to promote green and safer chemistry and engineering of products.

This article reviews the application of this approach to the release of polycyclic aromatic hydrocarbon compounds (PAHs) from coal-tar-based sealcoats in Minnesota and elsewhere around the Great Lakes.

Why Coal-Tar Sealcoat Became a Priority in Minnesota

As described in other articles in this issue, research findings reported in the early 2000s revealed increasing PAH contamination in sediments collected from urban lakes, linking a significant proportion of that contamination to stormwater runoff from asphalt surfaces covered with coal-tar sealcoat. These findings were of immediate interest in Minnesota, where lakes and rivers have high social, cultural, recreational, and commercial value, and therefore have a strong history of protection through policies and programs.

Local governments have long provided the foundation of the state's stormwater management infrastructure. However, after 20 or more years of service, the stormwater catchments in many Minnesota cities are filling with sediment, particularly near stormwater entry points, reducing their ability to capture both runoff volume and pollutants. At the same time, the state has developed its municipal separate storm sewer system (MS4) program, which requires cities to monitor and clean out stormwater ponds.

Finally, Minnesota applies standards for cleaning up and managing contaminated sediments that can be quite stringent for high levels of individual and/or total PAHs in sediments due to their carcinogenic potential and persistence. Sediments that have high concentrations of PAHs must be transported to and disposed of at a permitted landfill with a liner sufficient to prevent the escape of contaminants.

The transport and disposal of sediment with high concentrations of PAHs can cost cities as much as \$50 per cubic yard, up to three times the cost of on-site management such as berming. With 5,000 yards³ or more of highly contaminated sediment built up in some areas in ponds, the costs for cleaning out such ponds mount quickly. In 2010, MPCA estimated that if 10 percent of sediments in 20,000 Minnesota ponds exceeded the most stringent PAH standard, the total cost of clean up to Minnesota cities could exceed \$1 billion (Figure 1).

Minnesota promotes reductions of other active sources of PAH contamination such as wood fires and vehicle emissions. However, by 2009 the weight of evidence from research identified coal-tar sealcoat as a substantial source, and one of the more readily preventable ones. The specter of the enormous cost for sediment clean up therefore led cities to approach the Minnesota Legislature for remedies. In 2009, a statewide ban on coal-tar sealcoat use was proposed. However, instead of a statewide ban, the Legislature:

1. enacted a ban on state agency use;
2. required that cities inventory and assess their stormwater ponds;
3. directed the development of a model ordinance for local bans of coal tar;
4. provided grants to underwrite the cities' costs of sediment clean-up if they enacted a local ban.

Local bans would not solve current contamination issues. However, they would slow the rate of future contamination, reducing the future costs of clean up. Minnesota cities began enacting local bans in 2010 and within

*with contributions from Cheryl Kallio, *Freshwater Future*



Figure 1: Excavation of sediment from Varney Pond, White Bear Lake, Minnesota; left, before; right, in process.

three years, 29 were in place, primarily in the Twin Cities suburbs but with others sprinkled around the state.

Genesis of a Pollution Prevention Project

Because of these developments, by 2011 an environment of heightened awareness existed, accompanied by pressure on municipalities and the sealcoat supply chain. However, with most state waters not yet protected by bans, the MPCA decided to promote a voluntary phase-out of coal-tar sealcoat on a statewide basis. Since research around the Great Lakes Basin was finding coal-tar-sealcoat-based PAHs at significant levels at all study sites, MPCA teamed with the University of Wisconsin-Extension Solid & Hazardous Waste Education Center and the Michigan Department of Environmental Quality to propose a more far-reaching project.

MPCA was awarded a grant from U.S. EPA's Great Lakes Restoration Initiative (GLRI) program to support a coal-tar sealcoat pollution prevention project first in Minnesota, and then spreading education and effective prevention tools across the Great Lakes region (Figure 2).

Based on 21 years of experience in pollution prevention programs, MPCA had concluded that many conditions necessary for success were in place in Minnesota:

- Heightened awareness and concern over the cost of coal-tar PAH impacts – strengthened by sediment research in Minnesota showing local occurrences of high PAH levels with more than 50 percent contributed by coal tar;
- Pressure on retailers, distributors, and contractors from the accelerating pace of local bans;
- Availability of safer and affordable sealcoat alternatives. Pollution prevention outreach is more effective when the promoter is able to make referrals to feasible alternatives;
- Endorsement of the performance of asphalt based alternatives by the Minnesota DOT and other pavement experts. This was important because pavement preservation is a shared goal, for both economic and environmental reasons.

Implementation in Minnesota and Wisconsin

In the early stages of the project, MPCA and the University of Wisconsin-Extension worked with others to develop:

- Educational materials including guidance to assist pavement owners transition away from the use of coal-tar sealcoat. Guidance was prepared considering all alternative technologies (asphalt-based, acrylic, gilsonite, plant oil) but featured asphalt-based as the most proven and price-competitive.

- An inventory of providers (retailers, suppliers, contractors) of safer alternatives. Preparing the inventory was a significant effort that involved mining multiple data sets to locate the names and addresses of providers; crafting messages that would be compelling to busy owners of (mostly) small businesses; and following up with them by mail or e-mail. In response, and spurred by awareness of local concerns, 77 contractors and suppliers, or about 25 percent of those thought to be active in Minnesota at the time, signed a pledge not to apply coal-tar sealcoat.

Telephone surveys conducted later in the project resulted in ten completed interviews with contractors and suppliers in this pledged group. That group of ten reported eliminating 93,500 gallons of coal-tar sealcoat use per year. The PAH reduction associated with that amount is difficult to pinpoint, since sealcoat PAH concentrations may vary by batch, by company, or by varying methods of estimating concentrations found in the literature or in product data sheets. MPCA therefore presents reductions estimates for the group of ten respondents as a range, anywhere from 28 to 50 tons per year. Minus outliers, the average coal tar volume per contractor per year for this group was about 5,000 gallons.



Figure 2: Great Lakes Basin research.

In Wisconsin, 311 applicators were contacted: 26 (8 percent) signed a commitment not to apply coal-tar sealcoat. MPCA attributes this response to the fact that many western Wisconsin providers serve the Twin Cities, Duluth, or other border markets; the presence of a ban in Dane County (Madison), Wisconsin; and published findings from sediment PAH research conducted in the Milwaukee area.

As a resource to support pavement owners seeking providers of safer alternatives, MPCA staff produced an on-line map and listing of the applicators and suppliers in the Great Lakes area who signed a certification that they would not to apply coal-tar sealcoat (<https://www.pca.state.mn.us/water/find-contractors-applying-safer-sealcoat>). The map was later enhanced to include points where restrictions are in place.

- With supporting conditions and resources in place, project partners focused on educating owners and managers of properties that typically

require the maintenance of asphalt pavement. The target audience included school districts, shopping center and other commercial property owners and managers, hospital associations, industrial stormwater permittees, and faith-based organizations. Assistance in multiplying the message was accomplished by working with business assistance providers involved with environmental compliance and pollution prevention; the League of Minnesota Cities and city networks and other organizations in the Great Lakes area involved with resource sustainability or environmental protection; stormwater professionals, extension service networks; Parent Teacher Associations, and pavement engineers and associations. Information distribution was accomplished using web pages, e-mail blasts, targeted mail, phone calls, webinars, and press releases and interviews.

In all, MPCA estimates the project partners contacted over 31,000 organizations and individuals with

indirect messaging (through facilitators), 7,550 of these with messages generated directly by the partners.

Implementation in Michigan and Eastward

While outreach efforts in Minnesota and Wisconsin progressed well and produced reasonable results, the Michigan Department of Environmental Quality (DEQ) did not have the resources necessary to replicate the same level of outreach. Instead, Michigan focused its efforts on educating their pollution prevention and sustainability networks and on assessing the possibility of developing contaminated sediment clean-up standards and municipal separate storm sewer system (MS4) permits, which were already present in Minnesota and provide the necessary foundation for regulation.

Because some of the lack of response in Michigan and other Great Lakes states and provinces may have been due to the fact that the outreach was coming from an unfamiliar source, MPCA decided in fall 2013 to package the remainder of its

GLRI funds as a grant to an organization outside Minnesota or Wisconsin that could undertake a coordinated outreach effort to pavement owners and sealcoat providers in their geographic area. Freshwater Future, the Michigan water protection network and service provider, was awarded the grant and developed the outreach effort through the rest of 2014.

Freshwater Future is a very different originating organization than MPCA or Wisconsin-Extension: nongovernmental, activist, grassroots, and locally oriented, with a readymade network of Michigan municipalities and community-based watershed and public health protection organizations. In addition to organizations located in Michigan, Freshwater Future's membership also includes networks of organizations outside the state, across the Great Lakes Basin. The core of their work plan was to educate these networks on coal tar PAH issues, recruit partners from among those networks, and with those partners, implement local pollution prevention and regulatory initiatives that would protect community members and their waters.

At MPCA's direction, and with its technical assistance, Freshwater Future first carried out statewide contractor outreach, generating a list of 740 companies and contacts (many of which turned out not to be active), and seeking a pledge to reduce or eliminate coal-tar sealcoat applications. However, there was little response to this effort from Michigan suppliers and contractors. Michigan has nine pledged companies now, and most of those responded to independent local efforts in the Grand Rapids area in western Michigan and the Huron River watershed area in the southeast. Only two in Michigan and four in Ontario responded to Freshwater Future. This led Freshwater Future and MPCA to conclude that additional local awareness and impetus from the user/owner/community end of the supply chain was necessary – and might lead eventually to greater response by providers.

Freshwater Future ramped up outreach to local organizations and municipalities to build awareness of coal-tar PAH impacts. Ten organizations around the Great Lakes signed on to assist, and 11 others agreed to educate their stakeholders. Freshwater Future

found that whenever they approached a new audience with information on coal-tar PAH hazards, there were questions as to why the purpose of the outreach was not aimed primarily at regulatory bans. It took nuanced explanation to show that bans were difficult to accomplish politically, may not be a tool available in charter to all municipalities, and might only be applicable to public property (not private) or to use (not sales).

Nevertheless, some 40 of the 77 Michigan cities and townships Freshwater Future approached considered ordinances or resolutions banning coal tar use on publicly owned property, sometimes on private property (citywide), or if not bans, then education and promotion of safer alternatives with their citizens. Thirteen municipalities adopted resolutions during the project.

In conjunction with these efforts focused on local government, Freshwater Future approached two types of entities not previously targeted in Minnesota and Wisconsin: one on the user/owner end of the supply chain (168 universities and colleges), and the other on the supply end (205 distributors and local hardware stores in the targeted geographic jurisdictions). Five U.S. and two Canadian universities committed to eliminate or reduce coal tar use, while among retailers, 36 stores considered not selling coal-tar sealcoat; ultimately, nine made that commitment.

In the course of the project, Freshwater Future's outreach energized the Huron River Watershed Council (HRWC) in southeast Michigan on the coal tar issue. HRWC's subsequent education of local governments in the watershed led to four new restrictions on coal tar use, and in a couple of those cases, to limits on the concentrations (either 0.1 percent or 1 percent by weight) of total PAHs present in sealcoat. A group of governments west of Chicago also adopted this approach of limiting total PAH content.

MPCA estimates that 62 organizations outside Minnesota and Wisconsin and on the user or purchaser end of the supply chain made decisions to eliminate or reduce coal-tar sealcoat in response to the project's outreach.

Imposing limits to total PAH content as a different approach to regulation was

spurred by the industry's introduction in 2015 of a non-coal-tar sealcoat based on steam-cracked petroleum residues (CAS 64742-90-1). While not as high as coal tar in total PAHs or the heavier molecular weight PAHs that end up in sediments, this material can contain up to 3 percent (30,000 parts per million) total PAHs. In addition, it has high levels of lighter, more volatile PAHs that are an inhalation concern (such as naphthalene, which was clearly connected to carcinogenic activity in animals by the National Toxicology Program in 2001), or medium-weight PAH molecules which can be an aquatic toxicity concern. By comparison, asphalt-based sealcoats contain 0.005 - 0.1 percent total PAHs.

Back in Minnesota, cities renewed their call for a statewide sales and use ban at the 2013 legislative session. That proposal was enacted in May 2013 and has been in effect since January 2014. The numerous local bans, looming sediment clean-up costs, and the 77 contractor commitments indicating willingness within the industry to use alternative sealcoat products – all played a role in the passage of the statewide ban.

Conclusion

While reductions in Minnesota documented by and attributable to the project are relatively small (93,500 gallons per year), one should remember that they are only those reported voluntarily by ten responding contractors, resulting in anywhere from 28 to 50 tons of PAH reductions in those ten contractors' service areas. This may suggest that investing in developing local conditions to drive supply chain change has good potential for significant local PAH reductions.

MPCA concludes that, given conducive supporting conditions, voluntary pollution prevention initiatives can produce real pollutant reductions and build the case for wider-scale (e.g., statewide) restrictions on sales and use. If there is little local awareness, education can spur local government and retailer action to eliminate use, particularly where stakeholders are motivated to protect a local natural resource perceived to hold high value.

MPCA's Pollution Prevention Program has committed to maintaining

the dynamic page at <https://www.pca.state.mn.us/water/find-contractors-applying-safer-sealcoat>. This will involve continuing to post forms for contractors, suppliers, retailers, municipalities, and universities to use to make commitments to eliminate coal-tar sealcoat use, to accept completed forms and to post their commitments on the map and list on that page. The other pages linked there are more static, so their maintenance should also be feasible.

MPCA will also monitor research to assess sediment coal tar PAH levels in areas where prevention projects or bans have been implemented. One such study suggests that reductions may begin to show up in sediment in as little as eight years. Planning and securing resources for a 2024 follow-up at Minnesota sites studied 15 years earlier might demonstrate the value of reduction efforts.

Possible Future Efforts

1. *Expand partnerships with hospitals, other care facilities, medical organizations and schools.* A number of those that MPCA and partners contacted suggested that health care and educational institutions would be interested in acting on coal-tar sealcoat use – the medical facilities for public health purposes, and the schools to protect their students. MPCA conducted some outreach to hospital and health care associations, but did not invest resources in a full partnership and direct outreach. This could be a productive approach, and yield subsequent support from health facilities and associations as a public health improvement opportunity.

2. *Consider developing and offering applicator trainings.* MPCA worked with a local provider to develop training for winter maintenance (road salt reduction) providers to address increasing chloride contamination in urban lakes and streams. Much of the early resistance by sealcoat contractors to the use of coal tar alternatives was due to early formulations that did not perform well and have since been improved, and to the use of application methods suited to coal tar but not for the alternatives. Training would help to alleviate contractors' concerns, elevate professionalism, and improve the performance of alternatives.

3. *Support the development and acceptance of cost-competitive, zero-PAH sealcoats.* As suggested earlier, one response from the sealcoat industry to pressure on coal tar was to introduce another high-PAH alternative in 2015. Technically legal in areas with a coal tar ban, this option nevertheless releases carcinogenic and toxic PAHs that can be harmful to people and animals. In addition, this alternative product smells and reacts to other screening tests exactly like coal tar when applied, making compliance with sealcoat restrictions more difficult and costly to assess.

The MPCA and its partners would prefer an eventual option that is cost competitive and contains zero PAHs. MPCA has encouraged makers of newer, zero-PAH sealants or rejuvenators to work with transportation departments and other experts to test the pavement preservation performance of their products to standards, and to submit their formulations to EPA's Safer Choice program, Green Seal, or other confidential, third-party certifiers to establish them as clearly safer alternatives.

4. *Leverage sustainability efforts.* There is a growing number of sustainability initiatives within cities, companies, colleges, and community and regional organizations. Developing and acting on information on the use of fertilizers, coal tar sealcoats, or other potentially toxic chemicals in products used by organizations in their business or on their properties would broaden the scope of many organizations' sustainability programs,

Literature Cited

- Crane, J.L., K. Grosenheider and C.B. Wilson. 2010. Contamination of Stormwater Pond Sediments by Polycyclic Aromatic Hydrocarbons (PAHs) in Minnesota: The Role of Coal Tar-based Sealcoat Products as a Source of PAHs. www.pca.state.mn.us/index.php/view-document.html?gid=12960.
- Crane, J.L. 2014. Source apportionment and distribution of polycyclic aromatic hydrocarbons, risk considerations, and management implications for urban stormwater pond sediments in Minnesota, USA. *Arch Environ Contamin Toxicol*, 66:176-200

Freshwater Future:

- Coal Tar Sealcoats web page <https://freshwaterfuture.org/ourissues/coal-tar-sealants/>
- Kallio, C. 2014. Ending the Use of PAH-Based Coal Tar Sealants in the Great Lakes Region: Final Report to the Minnesota Pollution Control Agency (Freshwater Future).

United States Geological Survey Research: PAHs and Coal-Tar-Based Pavement Sealcoat (USGS web site) <https://tx.usgs.gov/sealcoat.html>.

University of Wisconsin-Extension Solid & Hazardous Waste Education Center (fact sheets) <http://shwec.engr.wisc.edu/publications>

- Coal Tar-Based Asphalt Sealcoats – A Health and Environmental Hazard
- Non-Coal Tar applicators
- Avoiding High Costs from Stormwater Sediment Contaminated by Coal Tar-Based Asphalt Sealcoats

For the past 7 of his 22 years at the Minnesota Pollution Control Agency, **Al Innes** has been leading the agency's initiatives to support safer product chemistries that reduce environmental loadings of hazards. Prior to this work, Al led several MPCA initiatives using pollution prevention and environmental management systems approaches in permitting, inspections, self- and third-party auditing, and performance-based incentive programs. He has delivered pollution prevention assistance through grants, outreach, and training, both at MPCA and in the non-profit sector previously. You may contact Al Innes (alister.innes@state.mn.us) for further details and lessons learned from the project. 



Frequently Asked Questions:

Polycyclic Aromatic Hydrocarbons (PAHs)

Q) Aren't polycyclic aromatic hydrocarbons (PAHs) also in some foods, medicines, and shampoos? Are the risks to human health comparable?

A) PAHs are present in some foods, medicines, and shampoos. However, the risks from food-derived sources of PAHs and medicinal uses of coal tar are not comparable since these exposures are a matter of consumer choice and the concentrations of those PAH compounds of concern to human health are not the same. The choice to use a product containing coal tar as a treatment for a medical condition is weighed against the potential benefits of the exposure. Generally, medical treatments are limited to those suffering a disease. Consumption of food containing PAHs (such as charcoal-grilled meat) is also a matter of choice. While food exposures may be the greatest exposure to PAHs for most people, typically carcinogenic PAH concentrations in contaminated sediment and soil are two or more orders of magnitude greater than carcinogenic PAH concentrations in food. Because environmental exposures to PAHs can be significant for some people, homeowners and businesses alike are encouraged to ask retailers and commercial applicators for products that are not coal-tar based.

Q) How can I tell if a sealcoat product contains coal tar?

A) To determine if the product has a coal-tar base, look for the Chemical Abstracts Service (CAS) number 65996-93-2, 65996-89-6 or 8007-45-2 on the product Material Safety Data Sheet (MSDS). The words "coal tar," "refined coal tar," "refined tar," "refined coal-tar pitch," "RT-12," "tar" or other similar terms may be listed on the MSDS or on the product container.

Q) How can I tell if the existing sealant on my driveway contains coal tar?

A) The most accurate way to determine whether sealant contains coal tar is to request analysis of the sealant by a laboratory experienced in testing for PAHs. Two inexpensive field tests may be used to help screen for the presence of coal tar. First, coal-tar-based sealcoats typically have a strong mothball-like odor indicative of the presence of naphthalene, whereas, asphalt and acrylic sealcoats do not. Second, the City of Austin, Texas, developed a qualitative screening test to check for the presence of coal tar. The screening test involves collection of pea-sized samples of the top layer of sealcoat, which are combined in a small glass container with a small amount of a paint thinner containing mineral spirits, or aliphatic petroleum distillates. The sample-solvent mixture is gently agitated for up to 30 minutes and evaluated for color change. A translucent amber/yellow color with no significant degradation of the particles is usually indicative of coal-tar sealants. A translucent red/brown color with no significant degradation to the sample is indicative of blended coal tar and asphalt materials. An opaque brown/black color and degradation of the sample material is indicative of asphalt sealant. Steam-cracked petroleum residue sealcoat, a recently introduced product, has been found to have high concentrations of naphthalene. So, new applications of this product will smell similar to coal-tar sealcoat. Steam-cracked petroleum residue

sealcoat will also produce the same result in the solvent test as coal-tar sealcoat. So, the aforementioned screening tests will not discriminate this new product from coal tar sealcoat.

Q) Is the use of coal-tar-based sealant regulated?

A) Coal-tar sealant is banned in several jurisdictions, including the states of Washington and Minnesota; the counties of Dane, Wisconsin; Montgomery, Prince George's, and Anne Arundel, Maryland and Suffolk, New York; the Cities of Austin and San Antonio, Texas, and Washington, D.C.

Q) What "best practices" should be followed in the application of sealcoat?

A) The following best practices should be considered for maintaining asphalt and applying sealcoat.

- **Monitor your pavement's condition and invest in treatments before significant deterioration occurs.** When fully cured, sealcoat covered pavement should have uniform coverage and appearance. All aggregate (small stones) should be covered without spaces, gaps or pinholes. Watch for the formation of cracks, gaps in the aggregate, and loss of the aggregate itself. While a sealcoat is a less-expensive, short-term treatment option, it may not be the most protective and cost-effective in the long run for your pavement's condition. If your pavement is older or has already deteriorated, a different treatment or total replacement with asphalt or other materials may be the best option. Consult with paving engineers or contractors about the history of damage and what future threats you need to protect against. Consider also whether your primary concern is the visual appearance versus preservation.
- **Avoid the use of products containing coal tar.** If sealcoat treatment is determined to be the best option, speak with two or more sealcoat or pavement contractors with experience using safer alternatives to coal tar like petroleum asphalt-based products.
 - *Review Product Data Sheets.* Work only with providers who can show you complete product data sheets to avoid those that contain coal tar. It is the buyer's responsibility to review the data sheets and speak with providers about key ingredients for pavement protection and manufacturer's recommendations for optimal application.
 - *Avoid the use of products that have labels containing the words "coal tar," "refined coal tar," "refined tar," "refined coal tar pitch," "coal tar pitch volatiles," "RT-12," "tar" or similar terms or have safety data sheets, container labels, or technical bulletins listing Chemical Abstracts Service (CAS) numbers 65996-93-2, 65996-89-6, or 8007-45-2.* Coal tar/asphalt blends with as low as 10 percent coal tar content may be offered. But even at this reduced level, PAH content is about 100 times higher than other alternative products such as asphalt-based sealcoat.

- **Consider alternatives to coal tar sealants.**

- Petroleum asphalt-emulsion (CAS number 8052-42-4) is the most common non-coal-tar sealcoat on existing asphalt pavement. Asphalt sealcoats contain PAHs, but at as little as 1/1000th the PAH level of coal-tar sealcoat products. Good asphalt sealcoat emulsions are affordable, provide a black appearance, can provide protection for two to four years if properly applied, and can be used in locations that ban coal tar.
- Gilsonite® and acrylic and agricultural oil-based sealants contain few or no PAHs, but they tend to be higher-priced and do not have as much of a performance track record as asphalt sealants. Even so, these products should be considered as research and market conditions evolve.

- **Repair and prepare the asphalt surface prior to applying sealcoat**

- Cracks in the asphalt one inch wide or less should be cleaned thoroughly and filled with a durable and flexible rubberized sealant that will adhere tightly to the asphalt. Cracks wider than one inch wide should be filled with new asphalt pavement.
- Clean the asphalt surface of any loose material to ensure effective bonding of the sealcoat

- **Follow the manufacturer's recommendations for mixing, application rate, and number of coats of sealant**

- **Apply sealcoat only under the right weather and temperature conditions**

- Application of asphalt sealcoat should take place only if the air temperature is at least 55° F and rising (typically May through September).
- Asphalt and other sealcoats should not be applied at night or when rain is expected in less than three hours, in foggy conditions, or when the pavement surface has standing water. Turn off or cover all sprinkler irrigation systems.

Q) Can coal-tar sealcoat be removed from pavement?

A) Safe removal of sealcoats and top layers from asphalt pavement is typically done by grinding or shot blasting. Removal is not

recommended for asphalt in poor condition or with significant cracking, since the blasting or grinding process may break the pavement into pieces. Safe removal of sealants or top layers of asphalt should include enclosing the grinding or blasting process, vacuum-collection of the debris (with HEPA filtration of the exhaust), and containing it for disposal. This includes providing the employees doing the removal with proper hearing, respiratory, and skin protection. Even with high-efficiency containment and collection, these protective measures are a necessary precaution given the health risks of working with coal tar and asphalt dust.

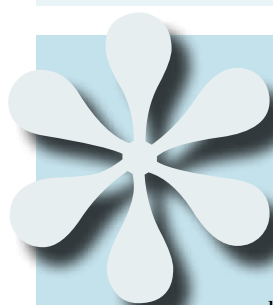
Property owners should ensure that their contractor is properly licensed and bonded and will use proper removal and disposal methods. Contacting neighboring property owners in advance is also encouraged so they may close windows and air intakes and take additional precautions to reduce exposure.

Coal-tar sealcoat and other removal debris should be disposed of properly. No matter the location, pavement owners and contractors must be aware of, and comply with, applicable local, state, or provincial requirements for management and disposal. For example, in Minnesota, coal-tar sealcoat removal debris should be disposed of in a solid waste landfill, with the approval of the landfill operator.

Removal costs around the U.S. have ranged from \$0.60 per square foot for larger surfaces to \$1.25 per square foot for small areas. However, experience is limited so there may be significant variation.

References

- Bashara, Thomas, R.S. T. Maurer and M. Scoggins. 2012. Pavement Sealant Solvent Screening Method. City of Austin Watershed Protection Department Environmental Resource Management Division, SR-12-08, 3p.
- Minnesota Pollution Control Agency. Coal tar-based sealcoat frequently asked questions. <https://www.pca.state.mn.us/water/coal-tar-based-sealcoat-faqs>
- U.S. Geological Survey. USGS Research: PAHs and coal-tar based pavement sealcoat. <http://tx.usgs.gov/seealcoat.html>
- University of Wisconsin, Solid and Hazardous Waste Extension Center. 2013. Choosing a coal tar-free sealcoat: Guidance for property owners and managers. 5p. http://shwec.engr.wisc.edu/wp-uploads/2015/08/Choosing_A_Sealcoat_6-7-13.pdf

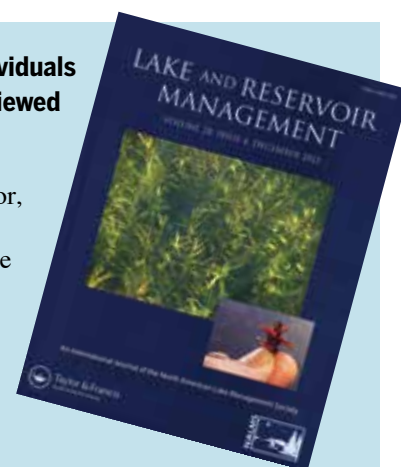


The NALMS Board of Directors is soliciting letters of interest from individuals who would be interested in serving as Editor for the society's peer-reviewed publication, *Lake and Reservoir Management*.

Interested individuals should have experience with the journal as an author, reviewer or associate editor, and have familiarity with the ScholarOne manuscript management system and with the wide range of topics that come under the umbrella of lake and reservoir management. Candidates for this position should have:

- Tact and diplomacy
- Excellent project management skills, attention to detail and demanding review timelines
- Excellent English writing and editing skills
- Lake or reservoir management experience

Interested individuals should send a letter of interest to Frank Wilhelm, NALMS President, expressing their interest in the position and briefly outlining their qualifications. Letters will be reviewed by the Publications Committee and further information will be requested if necessary. Materials will then be advanced to the *Lake and Reservoir Management* Editorial Board and the NALMS Board of Directors for further review and approval.



North American Lake Management Society Achievement Awards Call for Nominations



"You may delay, but time will not." –Benjamin Franklin

Start preparing your North American Lake Management Society Award nominations! Do not delay to put into words the actions and outcomes of an individual, organization, program, or corporation having notable impact in lake and reservoir management.

Award nominations are due August 15, 2017

NALMS AWARDS AND NOMINATION INFORMATION

Leadership and Service Awards

Nominations should detail how individuals or teams demonstrate leadership, service, and practice of lake and reservoir management. Selection criteria for Leadership and Service Awards include level of involvement, measurable impact, sustainability of action(s), and innovation in lake and reservoir management.

Volunteer

Nomination should address the significance of an individual or team's volunteer efforts devoted to lake and reservoir management. Professionals (i.e., anyone paid to work on the project) are ineligible.

Community Education and Outreach

Nomination should address an individual or team's design, facilitation, or performance of exceptional education and outreach activity facilitating community understanding and appreciation for lake and reservoir management.

Appreciation Awards

Nominations should address how individuals or teams contribute among a variety of lake and reservoir management areas. Selection criteria for Appreciation Awards include level of involvement, measurable impact, sustainability of action(s), and innovation in lake and reservoir management.

- *Secchi Disk Award* – Nomination should articulate how an individual member is considered to have contributed the most to the achievement of NALMS' goals. Award recipient must be a NALMS member.
- *Jim Flynn Award* – Nomination should recognize how an organizational member is considered to have contributed the most to NALMS' goal. Recipient must be a NALMS corporate member.
- *Friends of NALMS Award* – Nomination should detail major contributions of an individual or team to NALMS. Contributions extend beyond monetary donations.
- *Lake Management Success Stories* – Nomination should demonstrate an individual or team improvement in lake/reservoir condition or watershed management in a cost-effective manner.
- *Advancements in Lake Management Technologies* – Nomination should emphasize process of discovering, developing, or refining innovative methods, technologies, or processes targeting safer, cost-effective, and more effective lake/reservoir/watershed management. Individuals or teams completing research projects within the category that contribute to the science of lake management are eligible. Nominations should include supportive documentation (e.g., journal articles).

Nomination Eligibility

Secchi Disk Award and Jim Flynn Award nominations must be NALMS members. Current NALMS board members and members of the NALMS Awards Committee are not eligible for nomination.

Nominations

Any individual or entity may submit nominations. Nominations must include the following items:

1. Nominator contact information (name, title, mailing address, telephone number, and email)
2. Nominee contact information (name, title, organization/affiliation, mailing address, telephone number, and email)
3. NALMS Award for nomination
4. Brief and complete description of achievement(s) to be recognized and statement of how nominee's efforts meet specific award criteria.
5. Submit nomination by email to Dana Stephens, NALMS Award Liaison.
6. Please contact Dana with any questions or concerns.

NALMS Award Liaison : Dana Stephens • 100 College Blvd. • Niceville, FL 32578 • Phone: 850-729-6469 • Email: stephed@nwfsc.edu

Thank you for your nomination!

Andrew L. Labaj
and Branaavan
Sivarajah

Student Corner

**Looking back to manage the present and predict the future:
Using lake sediments to assess the long-term ecological
consequences of mining in Canada**

Paleolimnology: A Powerful Tool to Understand the Past

Natural resource extraction is an integral part of the Canadian economy, adding billions of dollars in revenue annually. Large-scale mining operations for metals began as early as the 19th century in Canada. However, environmental monitoring programs intended to assess the long-term ecological consequences of mining activities were only implemented well into the 20th century, often long after environmental impacts – such as acidification and metal pollution – had already occurred. In order to understand the long-term impacts of these industries on the environment, it is necessary to “look back” through time, and understand the environmental conditions that existed before industrial activities began, and the types of changes that occurred as a result of industrialization. A powerful method to accomplish this is through the use of paleolimnology, a discipline of limnology that reconstructs past environmental conditions using the information contained in lake sediments.

Lake sediments act as natural archives for their surrounding environment, preserving material from both inside and outside the lake. Information contained within the sediment record can be used to answer questions about environmental change – both natural and anthropogenic – through time (Smol 2008). Paleolimnological studies have been used to answer a number of applied environmental questions, however, some of the most striking examples of its usefulness relate to the assessment of mining impacts. Here, we highlight two examples where paleolimnology was successfully used to track the long-term impacts of

regional mining industries on aquatic environments.

A History of Acidification and Metal Contamination in Sudbury, Ontario

Sudbury, Ontario, has a long history of nickel and copper mining, with the discovery of the nickel deposits occurring in the 1880s. The initial ore roasting beds as well as early smelters released huge quantities of acid rain-causing sulfur dioxide (SO₂) into the atmosphere, which reached an area of 17,000 km² (equivalent to nearly 90 percent of the size of Lake Ontario) around the city (Keller et al. 2007). The large amount of acid rain in the region caused widespread damage to the landscape, killing off vegetation (resulting in a desolate landscape colloquially known as the “moonscape”) and acidifying thousands of surrounding lakes. The lakes closest to Sudbury also experienced contamination with nickel and copper particles, which are heavy and do not travel as far as SO₂ in the atmosphere. The combination of these stressors resulted in the loss of many fish species and radically altered food webs in lakes, which had been valued for their recreational use. Although the initial reports of lake acidification were released in the 1960s, the long-term history of damage to the lakes remained unknown – the roasters and smelters had been operating for more than 30 years before the pH scale had even been invented!

Paleolimnology provided a way to determine background conditions and to track the damage that had been done over time. The initial research examined diatoms and chrysophytes – two groups of algae that are sensitive to changes in lake water pH and metal concentrations and leave identifiable fossils in the sediments. Using statistical transfer functions, the

species composition and abundance of diatom and chrysophyte remains was used to reconstruct past pH levels. These methods work by establishing the optimal growth conditions of the species found in the sediments, and using their abundance to calculate the likely pH. A combination of sediment geochemistry and diatom- and chrysophyte-based transfer functions were also used to establish past metal concentrations. The early studies provided the much-needed pre-industrial environmental data and tracked the dramatic shifts in aquatic organisms in response to acidification and metal contamination through time. These studies found that many of the lakes surrounding Sudbury began acidifying and accumulating metals soon after the initial smelting operations commenced in the late 19th century. Furthermore, the pH at the most impacted lakes declined by as much as 2 pH units. Once the extent of the problem had been established, a number of emission reduction methods were put in place, including the installation of exhaust scrubbers to remove SO₂ from the smelter exhaust, as well as government-legislated emission controls that became progressively more stringent. Ongoing water quality monitoring programs indicate that these measures were effective, and many lakes in the Sudbury region have returned or are returning to their pre-industrial pH (Keller et al. 2007).

Although the pH of many Sudbury lakes has returned to pre-industrial levels, the biological recovery in these lakes continues to lag behind the chemical recovery (Keller et al. 2007). Just as it was useful for tracking the onset and extent of contamination, paleolimnology is equally well-suited for tracking chemical and biological recovery of the acidified and metal-contaminated

lakes. Recent paleolimnological analysis of several acidified Sudbury lakes has revealed that the Cladocera (a widespread mid-trophic level zooplankton group) and diatoms continue to remain altered from pre-acidification assemblages (Labaj et al. 2015; Sivarajah et al., *accepted*). The sedimentary cladoceran assemblages in lakes closest to the smelters (Daisy, Middle, and Clearwater) experienced the greatest species shifts as these lakes were exposed to the added stress of nickel and copper contamination (Figure 1). The most recent cladoceran assemblages in these lakes continue to differ from their pre-impact assemblages, likely due to ongoing copper and nickel contamination in sediments and the water column (Labaj et al. 2014; Labaj et al. 2015).

An experimental neutralization and fertilization was conducted in Middle Lake at the peak of acidification, resulting in the significant increase of algal primary production, however similar to the other Sudbury lakes, complete recovery has not occurred in the cladoceran species (Labaj et al. 2014). Copper and nickel contamination are likely inhibiting recovery in many of the lakes surrounding Sudbury (Labaj et al. 2015). Not surprisingly, George and Lumsden lakes (Figure 2) in Killarney Provincial Park – located ~60 km southwest of Sudbury – acidified, but experienced reduced metal contamination compared to the lakes located closer to the smelters in Sudbury. The acidification in these lakes was faithfully tracked by the sedimentary diatom assemblage changes (Sivarajah et al., *accepted*). Nonetheless, despite pH improvements in the most recent decades, the cladoceran and diatom assemblages of these lakes differ substantially from their pre-acidification states.

In the region as a whole, the recent paleolimnological studies have revealed a new stressor now impacting the lakes: climate warming. Although new industrial contamination has largely been reduced in the Sudbury area, regional air temperatures have increased in recent decades (Figure 3), and the impacts of regional warming are altering the lakes and their biological communities (Labaj et al. 2015; Sivarajah et al. 2016; Sivarajah et al., *accepted*). As climate change continues to impact these lakes, their biological communities will likely never again resemble those of the past.

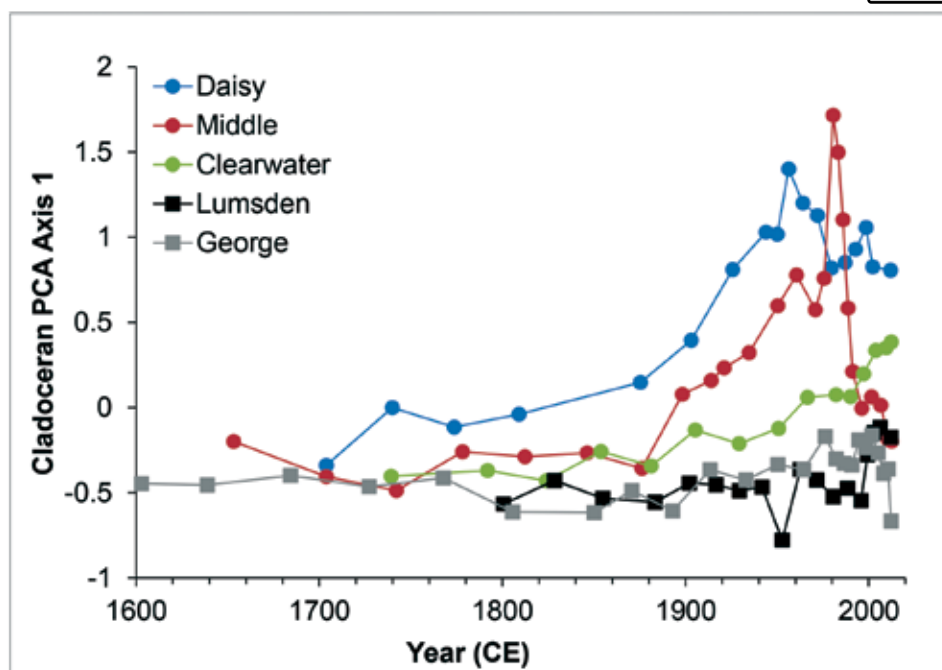


Figure 1. Cladoceran data for each lake (summarized using principal components analysis (PCA)) over time. PCA axis 1, displayed here, accounts for 48.7 percent of the variation in cladoceran assemblages. Circular markers represent the three lakes located closest to Sudbury, while square markers represent the two lakes located approximately 60 km from the city.



Figure 2. View of Lumsden Lake and surrounding landscape, Killarney Provincial Park.

Gold Mining and Arsenic Contamination in Yellowknife, Northwest Territories

Recently, paleolimnology has been applied in Yellowknife, Northwest Territories, to assess the legacy effects of gold mining on subarctic lakes. During

the early 20th century, gold deposits were discovered within the ore bodies of arsenopyrite in the Yellowknife greenstone belt. This discovery resulted in the establishment of gold mining operations in the area, and spurred major

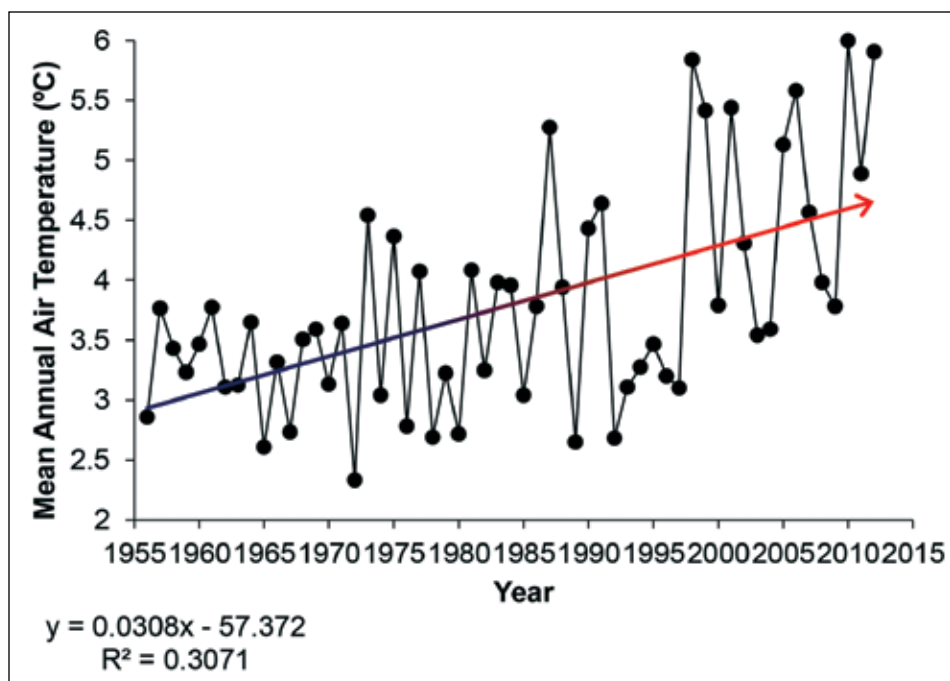


Figure 3. Mean annual air temperature recorded at Sudbury Airport (climate station ID: 71730). Data from Environment Canada. Trend is indicated by colored linear regression line ($r^2 = 0.31$).

growth of the City of Yellowknife. Giant Mine operated between 1948 and 2004, producing ~220 tons of gold along with ~20,000 tons of toxic arsenic trioxide dust as a by-product, that was released to the environment. The half-century of mining activity at Giant Mine led to the arsenic contamination of many surrounding lakes in Yellowknife. Presently, arsenic levels in many lakes within a 15-km radius of Giant Mine are well above the maximum allowable concentrations for the protection of aquatic life and drinking water (5 and 10 µg/L, respectively) (Houben et al. 2016), posing a potential threat to human health, as many of the lakes around the City of Yellowknife are used for recreational purposes. As with the lakes in Sudbury, the lack of long-term monitoring data required the use of indirect methods such as paleolimnology to assess the long-term ecological consequences of arsenic contamination of lakes around Yellowknife.

In one highly impacted lake within the lease boundary of Giant Mine, paleolimnological analyses revealed increases in several pollutants linked to arsenopyrite processing, including arsenic, mercury, antimony, lead, and iron, as operations at Giant Mine progressed. At the same time as these pollutants were increasing, the biological communities

of the lake were also changing, including shifts in the diatom species, and a complete elimination of the Cladocera (Thienpont et al. 2016). The striking similarity in the timing of chemical and biological changes clearly indicates that lake sediments are faithfully recording the increases in aquatic contaminant concentrations and the biological shifts occurring as a result of increased pollutants in the lake from Giant Mine operations. The present results have shown that paleolimnology can reliably track the onset and effects of regional gold mining, and have led to ongoing studies in other lakes surrounding Yellowknife, tracking the long-term ecological consequences of arsenic contamination in the region as a whole. The work in this region has provided an important opportunity to combine paleolimnology and ecotoxicology to better understand the impacts of mining, arsenic contamination, climate warming and local land use changes in subarctic lakes.

Conclusions

Paleolimnology provides the much needed long-term perspective on environmental change that is often not available otherwise. It provides powerful tools to qualitatively and quantitatively gauge the human “footprint” on the

environment, a vital first step in providing appropriate context to our past and present environmental issues. In many cases, paleolimnological studies have provided the “smoking gun” necessary to introduce environmental policy and lead to positive change.

References

- Houben, A.J., R. D’Onofrio, S.V. Kokelj and J.M. Blais. 2016. Factors affecting elevated arsenic and methyl mercury concentrations in small Shield Lakes surrounding gold mines near the Yellowknife, NT, (Canada) Region. *PLoS ONE*, 11(4): e0150960.
- Keller, W., N.D. Yan, J.M. Gunn and J. Heneberry. 2007. Recovery of acidified lakes: lessons from Sudbury, Ontario, Canada. *Water Air Soil Pollut: Focus*, 7: 317-322.
- Labaj, A.L., A. Jezierski, J. Kurek and J.P. Smol. 2014. Long-term trends in cladoceran assemblages related to acidification and subsequent liming of Middle Lake (Sudbury, Canada). *Water Air Soil Pollut*, 225: 1868.
- Labaj, A.L., J. Kurek, A. Jezierski and J.P. Smol. 2015. Elevated metal concentrations inhibit biological recovery of Cladocera in previously acidified boreal lakes. *Freshwater Biol*, 60: 347-359.
- Sivarajah, B., K.M. Rühland, A.L. Labaj, A.M. Paterson and J.P. Smol. 2016. Why is the relative abundance of *Asterionella formosa* increasing in a Boreal Shield lake as nutrient levels decline? *J. Paleolimnol*, 55: 357-367.
- Sivarajah, B., K.M. Rühland and J.P. Smol. Are diatoms recovering to pre-acidification assemblages in a warming world? Revisiting Killarney Provincial Park lakes (Ontario, Canada). *Fundam Appl Limnol*, (accepted).
- Smol, J.P. 2008. Pollution of Lakes and Rivers: a Paleoenvironmental Perspective. 2nd edition. Blackwell Publishing, Oxford, UK. 383 pp.
- Thienpont, J.R., J.B. Korosi, K.E. Hargan, T. Williams, D.C. Eickmeyer, L.E. Kimpe, M.J. Palmer, J.P. Smol and J.M. Blais. 2016. Multi-trophic level response to extreme metal contamination from gold mining in a subarctic lake. *Proc R Soc B*, 283: 20161125.

(Student Corner, continued on p. 28 . . .)

Bill Jones Literature Search

Archiv für Hydrobiologie

Bolgovics, Á., É. Ács, G. Váró, J. Görgényi, K. Tihamér, F. Keve, A. Földi, Z. Nagy-László, Z. Trábert and G. Borics. 2017. Benthic diatom-based lake types in Hungary. *Archiv für Hydrobiol*, 189(2): 105-116.

Canadian Geographer

Knight, W. and S. Bocking. 2016. Fisheries, invasive species, and the formation and fracturing of the Great Lakes system. *Can Geographer*, 60(4): 446-457.

Canadian Journal of Fisheries and Aquatic Sciences

Cupp, A.R., R.A. Erickson, K.T. Fredricks, N.M. Swyers, T.W. Hatton and J.J. Amberg. 2016. Responses of invasive silver and bighead carp to a carbon dioxide barrier in outdoor ponds. *Can J Fish Aquat Sci*, 74(3): 297-305.

Freshwater Biology

Teixeira, M.C., L.M. Bini and S.M. Thomaz. 2017. Biotic resistance buffers the effects of nutrient enrichment on the success of a highly invasive aquatic plant. *Fresh Biol*, 62(1): 65-71.

Blottière, L., M. Jaffar-Bandjee, S. Jacquet, A. Millot and F.D. Hulot. 2017. Effects of mixing on the pelagic food web in shallow lakes. *Fresh Biol*, 62(1): 161-177.

Lau, D.C. P., T. Vrede and W. Goedkoop. 2017. Lake responses to long-term disturbances and management practices. *Fresh Biol*, 62(4): 792-806.

Global Change Biology

Frisch, D., P.K. Morton, B.W. Culver, M.B. Edlund, P.D. Jeyasingh and L.J.

Weider. 2016. Paleogenetic records of *Daphnia pulicaria* in two North American lakes reveal the impact of cultural eutrophication. *Global Change Biol*, 23(2): 708-718.

Pourmokhtarian, A., C.T. Driscoll, J.L. Campbell, K. Hayhoe, A.M.K. Stoner, M.B. Adams, D. Burns, I. Fernandez, M.J. Mitchell and J.B. Shanley. 2016. Modeled ecohydrological responses to climate change at seven small watersheds in the northeastern United States. *Global Change Biol*, 23(2): 840-856.

Hansen, G.J. A., J.S. Read, J.F. Hansen and L.A. Winslow. 2016. Projected shifts in fish species dominance in Wisconsin lakes under climate change. *Global Change Biol*, 23(4): 1463-1476.

Hydrobiologia

Pomati, F., B. Matthews, O. Seehausen and B.W. Ibelings. 2017. Eutrophication and climate warming alter spatial (depth) co-occurrence patterns of lake phytoplankton assemblages. *Hydrobiologia*, 787(1): 375-385.

International Review of Hydrobiology

Kozak, A. and R. Gołdyn. 2016. Macrophyte response to the protection and restoration measures of four water bodies. *Internat Rev Hydrobiol*, 101(5-6): 160-172.

Journal of the American Water Resources Association

Coats, R., J. Lewis, N. Alvarez and P. Arneson. 2016. Temporal and spatial trends in nutrient and sediment loading to Lake Tahoe, California-Nevada, USA. *J Am Water Resour Assoc*, 52(6): 1347-1365.

VanderMeulen, D.D., B. Moraska Lafrancois, M.B. Edlund, J.M. Ramstack Hobbs and R. Damstra. 2016. Pairing modern and paleolimnological approaches to evaluate the nutrient status of lakes in Upper Midwest national parks. *J Am Water Resour Assoc*, 52(6): 1401-1419.

Journal of Flood Risk Management

Moura, N.C.B., P.R.M. Pellegrino and J.R.S. Martins. 2016. Best management practices as an alternative for flood and urban storm water control in a changing climate. *J Flood Risk Manage*, (9): 243-254.

Soil Use and Management

Andersson, H., L. Bergström, L., F. Djodjic, B. Ulén and H. Kirchmann. 2016. Lime placement on subsoil as a strategy to reduce phosphorus leaching from agricultural soils. *Soil Use Manage*, 32(3): 381-389.

Weed Research

Hussner, A., M. Windhaus and U. Starfinger. 2016. From weed biology to successful control: an example of successful management of *Ludwigia grandiflora* in Germany. *Weed Res*, 56(6): 434-441. 🌱

Lakes Appreciation Month 2017

Enjoy and help your favorite lake in July!

July 1st - July 31st



From fishing to your daily coffee,

lakes and reservoirs play a vital role in our daily lives. For over 20 years, **July** has been officially **Lakes Appreciation Month**. It is a time when many folks are vacationing and enjoying lakes, and NALMS wants people to give something back. Just think, what would your life be like without lakes?

July is a great time to set aside some time to celebrate and help your favorite waterbody. Here are some ideas for a lake event in July: organize a shoreline clean up, hand out free fishing poles, arrange for free boat rides and canoe lessons, hand out free t-shirts with the new Lakes Appreciation Month design, find volunteers to participate in the **Secchi Dip-In**, and free food is always a hit. There are many other ideas that can be found at www.nalms.org or www.epa.gov/lakes.



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37th Annual Symposium of the North American Lake Management Society

Finding Balance

November 6 – 9, 2017 - The Westin Westminster



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After 26 years, Colorado welcomes NALMS back to the headwaters state. Colorado is home to thousands of both natural alpine lakes and reservoirs. We are proud of our mountains and appreciate the importance of our lakes and reservoirs.

Water in Colorado is used for fishing, drinking, farming, rafting, camping, mining, ranching, boating, brewing, and much more. All of these uses are supported with a stateside annual average rainfall of just 17 inches. The lakes and reservoirs throughout the West and the Rockies provide the resources to meet these diverse needs. Finding balance in how we manage them is important.

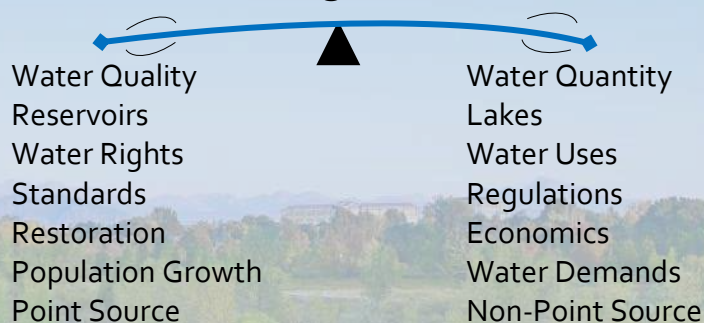
Finding Balance is key to managing our lakes, watersheds, and even day-to-day relationships with people. Come to Colorado in 2017 to, hear fascinating lake talks, drink great beer, see the Rocky Mountains, and to achieve balance in managing your lakes and reservoirs.

Potential Topics

Reservoir Management
Drinking Water Treatment
Arid West Issues
Inter-basin Water Transfers
Watershed Management
Climate Change Impacts
Storm Water Impacts
Wildfire Impacts

Harmful Algal Blooms
Beer-sheds & Brewing
Invasive Species
Western Water Law
WQ Monitoring
Citizen Science
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Coal-Tar-Based Pavement Sealcoat and PAHs: Implications for the Environment, Human Health, and Stormwater Management

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■ INTRODUCTION

Driveways and parking lots are common features of cities, suburbs, and small towns. Most single-family residences in the U.S. have paved driveways, and we encounter parking lots at multifamily residences, schools, offices, and commercial businesses. Most people in developed countries, when outdoors, probably spend as much time walking on pavement as on any other type of surface.

There are differences among paved surfaces, however. Most pavement is concrete or asphalt. The asphalt pavement of many parking lots, driveways, and even some playgrounds in North America is sprayed or painted with a black, shiny coating referred to as “sealcoat,” “pavement sealant,” or “driveway sealer” (Figure 1A). Sealcoat is marketed as improving pavement appearance and increasing pavement longevity.¹ In addition to making pavement black, however, one type of commonly used pavement sealcoat contains refined coal tar and is a potent source of polycyclic aromatic hydrocarbons (PAHs).^{2–8} The contribution of pavement sealcoat to PAH contamination of soils, lakes, and homes has only recently been recognized.^{4–6}

Coal-Tar-Based Sealcoat: A Newly Identified Source of PAHs. The two primary sealcoat product types on the market are refined coal-tar-pitch emulsion and asphalt emulsion. Coal-tar pitch, a known (Group 1) human carcinogen,⁹ is the residue remaining after the distillation of crude coal tar (a byproduct of the coking of coal), and contains about 200 PAH compounds.¹⁰ Most coal-tar-based sealcoat products consist of 20–35% coal-tar pitch as the binder. Asphalt is the residue remaining after the distillation of crude oil and is the binder in asphalt-based sealcoat products. Although the two sealcoat product types are

similar in appearance, PAH concentrations in coal-tar-based sealcoat are about 1000 times higher than those in asphalt-based sealcoat¹¹ (Table 1).

In the U.S., coal-tar-based sealcoat is used primarily east of the Continental Divide, and asphalt-based sealcoat is used primarily west of the Continental Divide.³ Coal-tar-based sealcoat also is used in Canada.¹² Geographic differences in use in North America likely are a historical and economic artifact of the location of most coal-tar-distillation plants near steel mills, which historically were (and are) in the central and eastern United States. An estimated 85 million gallons (320 million liters) of coal-tar-based sealcoat are used annually in the United States.¹¹

The pavement sealcoat issue has been evolving since 2000, when PAH concentrations were discovered to be increasing in many urban lakes across the United States,¹⁵ even as concentrations of other contaminants like lead, polychlorinated biphenyls (PCBs), and DDT were decreasing.^{16,17} This was an apparent reversal from earlier reports that PAH concentrations in the U.S. were decreasing in response to reduced emissions from power plants and industries.^{18,19} The earlier studies, however, had focused on lakes in undeveloped watersheds, whereas the upward trends in PAHs were in lakes in urban and suburban watersheds. This meant, first, that reductions in PAH emissions caused by changes in home-heating and power-generation technology had been eclipsed in urban areas by some other urban source of PAHs,¹⁵ and second, that this other source was specific to urban and suburban areas.

A breakthrough in understanding urban sources of PAHs came in 2003, when staff with the City of Austin, TX, noted elevated PAH concentrations ($\Sigma\text{PAH}_{16} > 1000 \text{ mg/kg}$) in some sediment samples collected from small tributaries and drainages in largely residential areas.²⁰ Concentrations of PAHs this high are typical of contaminated soils at some manufactured gas plant Superfund sites,²¹ but cannot be accounted for by common urban sources (e.g., tire wear, vehicle emissions, asphalt).² City of Austin staff connected the dots and hypothesized that the source of the elevated PAHs was particles eroded from parking lots that were coated with coal-tar-based sealcoat.²² Since that time, an understanding has emerged of relations between coal-tar-based pavement sealcoat and PAHs in the environment.

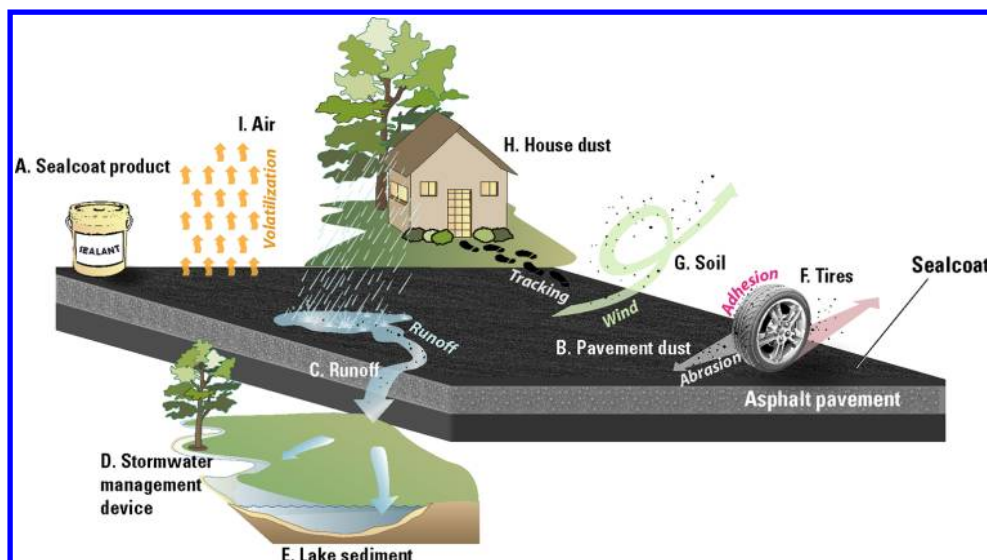


Figure 1. PAHs from coal-tar-based pavement sealcoat are transported by different pathways to various environmental compartments. Once dry, the sealcoat product (A), which contains high concentrations of PAHs, is abraded into a powder and becomes part of the dust on the pavement (B). That dust is transported by storm runoff (C) to stormwater management devices (D) or to receiving streams and lakes (E). Parking lot dust also adheres to tires (F) that track it onto unsealed pavement, and wind and runoff transport the dust to nearby soils (G). Dust particles also are tracked on shoes into residences, where they become incorporated into house dust (H). Volatile PAHs in coal-tar-based sealcoat are released into the air (I). PAH concentrations associated with each compartment and literature sources are provided in Table 1.

WHAT ARE POLYCYCLIC AROMATIC HYDROCARBONS (PAHS)?

PAHs are a large group of organic compounds composed of two or more fused benzene rings arranged in various configurations. Those with a low molecular weight (two or three benzene rings) tend to be more volatile, soluble, and biodegradable than those with a higher molecular weight (four or more benzene rings). PAHs occur naturally in coal and petroleum products and are formed by the incomplete combustion of organic matter, from fossil fuels to wood to cigarettes. PAHs have many urban sources, including used motor oil, automobile exhaust, industrial atmospheric emissions, tire particles, and asphalt.^{13,14} PAHs always occur as a mixture of different PAH compounds, and are ubiquitous in the urban environment. Of all known PAH sources, the highest concentrations are in coal tar and the related compound creosote. Most laboratories analyze only a subset of PAHs, and concentrations of total PAHs are reported as the sum of the subset analyzed as described in Table 1.

Migration of PAHs from Sealcoated Surfaces into the Environment. Sealcoat doesn't remain on the pavement surface indefinitely, and different applicators recommend reapplication from every 1 to 2 years (e.g., ref 23) to every 3 to 5 years (e.g., ref 24). Tires and snowplows, in particular, abrade the friable sealcoat surface into fine particles.^{5,11} The overall annual loss of sealcoat from parking lots in a warm climate is about 2.4% of total sealcoat applied, with wear being most rapid (about 5% per year) in driving areas.¹¹ Higher wear rates have been noted in a cold-weather climate.⁷ The mobilized sealcoat particles and associated PAHs are transported to various environmental compartments (Figure 1, Table 1).

The first compartment is the dust on the pavement surface itself, generated as the sealcoat is abraded from the surface

(Figure 1B). Concentrations of PAHs in fine particles (dust) on pavement with coal-tar-based sealcoat are hundreds of times higher than those in dust on concrete pavement or on asphalt pavement that is unsealed or that has asphalt-based sealcoat^{3–5} (Table 1). PAHs in dust on sealcoated pavement in the central and eastern U.S. are about 1000 times higher than in dust on sealcoated pavement in the western U.S., supporting anecdotal reports of geographic differences in product use³ (Figure 2).

Stormwater runoff transports abraded sealcoat particles off sealed pavement (Figure 1C, Table 1). The PAH concentration measured in particles in runoff from parking lots with coal-tar-based sealcoat (3500 mg/kg) was 65 times higher on average than the concentration in particles in runoff from unsealed asphalt and cement lots.² Concentrations in unfiltered stormwater runoff from coal-tar-sealcoated pavement are particularly elevated during the months following sealcoat application. The mean ΣPAH_{16} in stormwater runoff from a coal-tar-sealcoated parking lot during the 3 months following sealcoat application was 1357 $\mu\text{g/L}$ and the 3-month mean during the following two years ranged from 17 to 116 $\mu\text{g/L}$.⁷ This relatively elevated concentration persists for years—the median ΣPAH_{18} in stormwater runoff from a parking lot in Madison, WI, 5 years after the last application of coal-tar-based sealcoat, was 52 $\mu\text{g/L}$.²⁵ That concentration is about 10 times higher than that in runoff from a mixed-use strip mall, arterial street, and unsealed parking lot (4.8–5.7 $\mu\text{g/L}$), more than 20 times higher than in runoff from a minor arterial street and a commercial rooftop (1.8–2.4 $\mu\text{g/L}$), and about 1000 times higher than in runoff from a residential feeder street (0.05 $\mu\text{g/L}$).²⁵

In many communities, the first stop for stormwater runoff is a stormwater-retention pond or other stormwater-management device (Figure 1D), where suspended sediment and associated contaminants settle out. Stormwater ponds are designed to efficiently collect sediment-associated contaminants, which creates an unintended problem for many municipalities because PAHs accumulate in pond sediment. In 5 of 10 ponds sampled in the Minneapolis-St. Paul, MN, metropolitan area, concentrations

Table 1. Concentrations of PAHs as Reported in the Literature for Environmental Compartments Shown in Figure 1, and Definitions of PAH Summations Used

environmental compartment (Figure 1)	medium	PAH concentration (median or mean) in coal-tar-based sealcoat or affected medium	PAH concentration (median or mean) in asphalt sealcoat, affected medium, or associated with unsealed pavement	summation ^a	units	reference
A	sealcoat products	66 000	50	ΣPAH_{16}	mg/kg	11,22
B	pavement dust	2200	11	ΣPAH_{12}	mg/kg	3
		4760	9	ΣPAH_{16}	mg/kg	4
		685	<1	ΣPAH_{16}	mg/kg	5
C	runoff, particles	3500	54	ΣPAH_{12}	mg/kg	2
	runoff, unfiltered water ^b	71	2	ΣPAH_{16}	$\mu\text{g/L}$	7
		52	5	ΣPAH_{18}	$\mu\text{g/L}$	25
D	stormwater-management-device sediment	646	2	ΣPAH_{16}	mg/kg	5
E	lake sediment ^c	33	0.4	$\Sigma\text{PAH}_{\text{CMB}}$	mg/kg	6
F	tires	1380	3	ΣPAH_{16}	mg/kg	5
G	soil ^d	105	2	ΣPAH_{16}	mg/kg	5
H	settled house dust	129	5	ΣPAH_{16}	mg/kg	4
I	air (0.03 m from pavement), 3–8 years after sealing	1320	66	ΣPAH_8	ng/m^3	28
	air (1.28 m from pavement), 3–8 years after sealing	138	26	ΣPAH_8	ng/m^3	28
	air (0.03 m from pavement), 1.6 h after sealing	297 000	66	ΣPAH_8	ng/m^3	29
	air (1.28 m from pavement), 1.6 h after sealing	5680	26	ΣPAH_8	ng/m^3	29

^a ΣPAH_{12} is the sum of concentrations of the 12 parent PAH (naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, benzo[a]anthracene, chrysene, benzo[a]pyrene, and dibenz[a,h]anthracene), which are those PAHs used in computation of the probable effects concentration (PEC) sediment-quality guideline,⁴¹ less 2-methylnaphthalene. ΣPAH_{16} is the sum of the concentrations of the 16 priority pollutants identified by the U.S. Environmental Protection Agency,⁴² equal to the sum of ΣPAH_{12} and concentrations of benzo[b]fluoranthene, benzo[ghi]perylene, benzo[k]fluoranthene, and indeno[1,2,3-cd]pyrene. ΣPAH_{18} is equal to ΣPAH_{16} plus concentrations of 1-methylnaphthalene and 2-methylnaphthalene. $\Sigma\text{PAH}_{\text{CMB}}$ is the sum of concentrations of phenanthrene, anthracene, fluoranthene, pyrene, benzo[a]anthracene, chrysene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[ghi]perylene, benzo[k]fluoranthene, indeno[1,2,3-cd]pyrene, and benzo[e]pyrene. ΣPAH_8 is the sum of concentrations of phenanthrene, anthracene, 4,5-methylphenanthrene, 1-methylphenanthrene, fluoranthene, pyrene, chrysene, and benzo[b]fluoranthene. On the basis of PAH data from primarily combustion sources presented in Mahler et al.,⁴ ΣPAH_{12} is about 70–75% of ΣPAH_{16} . ΣPAH_{18} is similar to ΣPAH_{16} , as the additional compounds in the summation either are not detected or are detected at very low concentrations.^{2,25} ^bCollected >3 months after sealcoat application. ^cMeans for urban lakes with >70% PAH from sealcoat and 0–20% from sealcoat. ^dConcentration in soil adjacent to a sealed parking lot.



Figure 2. PAHs in dust swept from sealcoated parking lots show a striking geographic difference. PAH concentrations in dust from parking lots in central and eastern U.S. cities, where coal-tar-based sealcoat is commonly used, are about 1000 times higher than in the western U.S., where asphalt-based sealcoat is more commonly used. Concentrations are the sum of 12 PAHs (ΣPAH_{12}), in mg/kg. (Figure adapted from ref 3, Figures 1 and 2).

of PAHs in sediment exceeded Minnesota's Level 2 Soil Reference Value of 3 mg/kg benzo[a]pyrene equivalents (BaPeq), greatly increasing the cost for disposal.²⁶ Even a small amount of sealcoated pavement can be the dominant source of PAHs to sediment that collects in stormwater-management

devices, as demonstrated at the University of New Hampshire Stormwater Center.⁵ Sediment collected from a stormwater-management device receiving runoff from a parking lot with coal-tar-based sealcoat contained ΣPAH_{16} of 393–1180 mg/kg; sediment in devices receiving mixed runoff (4% sealed pavement and 96% unsealed pavement) contained 61–638 mg/kg ΣPAH_{16} ; and sediment in a device in the center of an adjacent unsealed lot contained less than 4 mg/kg ΣPAH_{16} .⁵

Some sealcoat particles that are not trapped by stormwater ponds or other collection devices are transported down streams and rivers to lakes, where they are deposited in lake sediment (Figure 1E). Do the PAHs associated with the particles constitute a majority of PAHs in urban lake sediments, and might coal-tar-based sealcoat account for many of the upward trends in PAHs reported by Van Metre et al.¹⁵ An initial indication comes from a comparison of PAH ratios, or “fingerprints”, of the dust collected from parking lots in nine U.S. cities to that of PAHs in sediment from lakes in the same watersheds.³ In the central and eastern U.S., PAH fingerprints of lake sediment and dust from sealcoated parking lots were similar, and were different from fingerprints of lake sediment and dust in the western U.S., reflecting regional differences in sealcoat product type used. A more sophisticated source-apportionment method—a statistical approach that quantifies

the contribution of sources with known PAH profiles to an environmental receptor—was used to quantify the contribution of identified urban PAH sources to PAHs in bed sediment in 40 U.S. urban lakes.⁶ Coal-tar-based sealcoat was estimated to contribute about one-half of the PAHs in the lake sediment, when averaged across the 40 lakes; vehicle-related sources and coal combustion also were important contributors. PAH concentrations in lake sediment and the proportion contributed from coal-tar-based sealcoat were greater in the central and eastern U.S. than in the western U.S. Using sediment cores, trends in PAHs were investigated for eight urban lakes; of the six with significant upward trends, source apportionment indicated that coal-tar-based sealcoat was the cause of the trend in all six of them.

Turning our attention back to sealed pavement, dust from pavement with coal-tar-based sealcoat contaminates nearby unsealed pavement, with concentrations decreasing with distance from the sealed pavement.⁵ A petrographic analysis of dust from unsealed pavement in Fort Worth, TX, found that coal-tar pitch was the dominant (92%) source of PAHs in the dust.⁸ Particles are transported by adhesion to vehicle tires and by wind from sealed to unsealed surfaces— ΣPAH_{16} in particles swept from tires driven over sealed lots were 400 times higher than in particles swept from tires driven over unsealed lots⁵ (Table 1, Figure 1F). Transport of abraded coal-tar-based sealcoat particles by wind and tires might be one reason why PAH concentrations in dust from unsealed parking lots in the central and eastern U.S. (median ΣPAH_{12} 27 mg/kg), where coal-tar-based sealcoat is predominantly used, are significantly higher than those in dust from unsealed parking lots in the western U.S. (median ΣPAH_{12} 0.8 mg/kg), where the asphalt-based product is predominantly used.³

PAHs in particles abraded from coal-tar-based sealcoat also are transported by wind, runoff, and snow removal to nearby soils (Table 1, Figure 1G). ΣPAH_{16} in surface soil adjacent to coal-tar-sealed lots at the University of New Hampshire was as high as 411 mg/kg, and concentrations decreased with distance from the sealed lot to less than 10 mg/kg.⁵ The highest concentrations were measured in areas where snow was piled adjacent to the lots during the winter months—snowplows were scraping the sealcoat off with the snow. PAHs in surface soils from commercial areas in Fort Worth, TX, were dominantly (88%) from coal-tar pitch.⁸

PAHs from pavement sealed with coal-tar-based sealcoat can contaminate the indoor environment (Figure 1H) as well as the outdoor environment. In a study in Austin, TX, apartments with parking lots with coal-tar-based sealcoat had ΣPAH_{16} in house dust that was 25 times higher, on average, than ΣPAH_{16} in house dust from apartments with parking lots with other surface types (concrete, unsealed asphalt, or asphalt-based sealcoat)⁴ (Table 1). The presence or absence of coal-tar-based sealcoat on the apartment complex parking lot was strongly correlated with PAH concentrations in house dust. Although tobacco smoking, candle and incense burning, and barbecue and fireplace use have been suggested to affect PAH concentrations in house dust, Mahler et al.⁴ found no relation between any of these and PAH concentrations in the house dust. Concentrations of individual PAHs in house dust collected from apartments in Austin adjacent to pavement with coal-tar-sealcoated parking lots were about 140 times higher than those measured in a study of house dust in California.²⁷ Lower concentrations of PAHs in house dust in California are consistent with the very low concentrations of

PAHs measured in pavement dust in the western U.S. (Figure 2), where coal-tar-based sealcoat is not commonly used.

In addition to contaminating stormwater, sediment, soil, and house dust, PAHs from coal-tar-based sealcoat contaminate air (Figure 1I). Several of the lower molecular weight PAHs in coal-tar-based sealcoat are volatile, which is why sealed parking lots and driveways frequently give off a strong smell. A recent study²⁸ reported that the flux of ΣPAH_8 from in-use parking lots with coal-tar-based sealcoat of various ages (mostly more than 3 years old) was 60 times higher than that from unsealed pavement on average. A second study²⁹ reported that ΣPAH_8 in air just after sealcoat application was hundreds to thousands of times higher than that above unsealed parking lots (Table 1), and that one-quarter to one-half of the PAHs in the applied sealcoat were lost to the atmosphere during the first 16 days following application. A mass balance indicated that ΣPAH_8 emissions from new applications of coal-tar-based sealant each year are larger than annual vehicle emissions of PAHs for the U.S.²⁹

Biological Concerns. The detrimental effects of PAHs on terrestrial and aquatic ecosystems are well documented.³⁰ For example, when fish are exposed to PAHs, they exhibit chronic effects, including fin erosion, liver abnormalities, cataracts, skin tumors, and immune system impairments leading to increased susceptibility to disease.³¹ When benthic macroinvertebrates—insects and other organisms that live at the bottom of rivers and lakes and that make up the base of the aquatic food chain—are exposed to PAHs, they are susceptible to a number of detrimental effects, including inhibited reproduction, delayed emergence, sediment avoidance, and mortality.³¹ The most important mechanism by which acute effects occur in benthic invertebrates is a nonspecific narcosis-like mode of action that results in the degradation of cell membranes.³² Ultraviolet (UV) radiation greatly increases the toxicity of PAHs in a wide variety of aquatic organisms.^{33–36}

As the importance of coal-tar-based sealcoat as a source of PAHs has emerged, several studies have looked at potential biological effects of this particular source of PAHs. When sediment was spiked with coal-tar-based sealcoat to provide a range of environmentally relevant PAH concentrations, frogs (*Xenopus laevis*) had stunted growth or delayed development at 30 mg/kg ΣPAH_{16} , and complete mortality occurred at the highest treatment of 300 mg/kg ΣPAH_{16} .³⁷ Salamanders (*Ambystoma maculatum*) and newts (*Notophthalmus viridescens*) exposed to sediment contaminated with coal-tar-based sealcoat at PAH concentrations similar to the highest treatment in the frog study had stunted growth, difficulty swimming or righting themselves, and liver problems.^{38,39} These effects were magnified by the addition of UV light.³⁸ At the community level, macroinvertebrate communities exposed to sediment spiked with coal-tar-based sealcoat had significant decreases in species abundance and richness at ΣPAH_{16} concentrations exceeding 300 mg/kg.⁴⁰ Similarly, in a study of urban streams, aquatic invertebrate communities downstream from parking lots with coal-tar-based sealcoat suffered losses of abundance and diversity along a gradient of increasing total PAH concentration, starting near the ΣPAH_{12} probable effects concentration (PEC) value of 22.8 mg/kg.^{20,41} These studies demonstrate that PAHs in sediment contaminated by coal-tar-based sealcoat are bioavailable and that environmentally relevant concentrations adversely affect amphibians and benthic communities, two robust indicators of aquatic ecosystem health. The finding of adverse biological effects to biota when exposed to

sediment with PAH concentrations near the PEC has widespread relevance: Of the 40 U.S. urban lakes investigated by Van Metre and Mahler,⁶ sediment in the nine lakes with the greatest mass loading of PAHs from coal-tar-based sealcoat had concentrations of PAHs that exceeded the PEC.

Human-Health Concerns. Coal tar and coal-tar pitch are listed as Group 1 (carcinogenic to humans) carcinogens,⁹ and the U.S. EPA currently classifies seven PAH compounds as probable human carcinogens (Group B2): benz[*a*]anthracene, benzo[*a*]pyrene, benzo[*b*]fluoranthene, benzo[*k*]fluoranthene, chrysene, dibenz[*a,h*]anthracene, and indeno[1,2,3-*cd*]pyrene.⁴² Coal tar itself is a powerful mutagen: The mutagenicity index for coal tar is about 1000 times that of asphalt cements.⁴³ However, although coal-tar-based sealcoat has been on the market since at least 1960,⁶ little has been published to date about the contribution of the sealcoat to PAH exposures and the associated potential for adverse human-health outcomes.

The elevated concentrations of PAHs in house dust, soil, air, water, and sediment associated with coal-tar-based sealcoat raise the possibility of several complete exposure pathways for humans. Incidental ingestion of house dust and soil is particularly relevant for small children, who put their hands and objects into their mouths. A recent study⁴⁴ reported that children living in homes adjacent to pavement with coal-tar-based sealcoat likely are exposed to about 14-fold higher doses of PAHs through ingestion of house dust than are children living in residences adjacent to unsealed pavement, and that exposure from ingestion of PAH-contaminated house dust is estimated to be more than double that from diet, even under conservative assumptions. Ingestion of contaminated soil is another way that children might be exposed to PAHs from coal-tar-based sealcoat, particularly given that ingestion rates of soil typically exceed those of house dust.⁴⁵ Incidental ingestion of dust directly from sealed pavement also might be important, because the extremely high concentrations of PAHs measured in these materials (Table 1) could translate to substantial doses from miniscule exposures. On a long-term basis, nondietary ingestion of PAH-contaminated house dust and soil likely are the most important routes of exposure, but a complete human-health risk analysis is required before the cancer risk associated with ingestion of these media can be quantified.

Other routes of exposure to coal-tar-based sealcoat, in addition to ingestion, might have implications for human health. Relatively high acute exposures might occur from inhalation of wind-blown particles or fumes that volatilize from sealed parking lots, especially during sealcoat application. Sealcoat applicators, in particular, might be subject to substantial inhalation exposures, but such exposures have not yet been characterized. Other potential routes include skin contact with sealcoat and abraded sealcoat particles and contaminated soil, sediment, dust, and water. Such exposures likely would be relatively infrequent and short-term. However, PAHs are readily absorbed through the skin,⁴⁶ and circumstances that increase the frequency or magnitude of exposure events, such as daily activity on pavement treated with coal-tar-based sealcoat, might be associated with increased cancer risk.

Regulatory and Retail Actions. Research to date, as documented here, provides a compelling weight-of-evidence that coal-tar-based sealcoat products are an important source of PAHs to our environment. A patchwork of actions has been taken to either ban or restrict the use of coal-tar-based sealcoat in the United States. The first ban was implemented by the City

of Austin, TX, in 2006.⁴⁷ As of January 2012, 15 municipalities and two counties in four states (Minnesota, New York, Texas, and Wisconsin), the District of Columbia, and the State of Washington had enacted some type of ban, affecting nearly 10.4 million people.⁴⁸ Other local and state jurisdictions have used voluntary or limited-use restrictions for certain groups (e.g., city government) to discourage the use of coal-tar-based sealcoat.⁴⁸

Minnesota, in particular, has been actively engaged in this issue after municipalities contacted state agencies and the Minnesota Legislature for assistance addressing PAH-contaminated stormwater pond sediment.⁴⁹ Costs for disposing of this sediment could reach \$1 billion if PAHs in sediment in just 10% of the estimated 20 000 municipal stormwater ponds in the Minneapolis-St. Paul, MN, metropolitan area exceed Minnesota's Level 2 human-health risk-based Soil Reference Value of 3 mg/kg BaPeq⁵⁰ (Donald Berger, Minnesota Pollution Control Agency, written communication, 2011). The Minnesota Legislature passed a bill in 2009 that provides small grants to local governments for use in treating or disposing of contaminated sediment in stormwater ponds, provided that the governments restrict the use of undiluted coal-tar-based sealcoat.⁴⁹ As of January 2012, 13 municipalities had passed ordinances and three municipalities have received grants for remediation of stormwater ponds.

Several national and regional hardware and home-improvement retailers have voluntarily ceased selling coal-tar-based driveway-sealer products.⁴⁸ Some private applicators have chosen to use only asphalt-based sealcoat (e.g., refs 51,52). Many professional sealcoating companies in areas unaffected by bans or restrictions use coal-tar-based sealcoat, however, and coal-tar-based sealcoat products are readily available online for purchase by homeowners.

No action has been taken at a federal level to restrict the use of coal-tar-based sealcoat. Coke product residues, such as coal tar, are not classified as hazardous waste under the Resource Conservation and Recovery Act if the product is recycled.⁵³ This exemption allows coal-tar pitch to be used in the production of aluminum (~95% of use), commercial carbon, built-up roofing, and pavement sealcoat.⁵⁴

Because PAHs are a ubiquitous and persistent class of urban contaminants, a decade or more might be required to assess the effectiveness of bans, restrictions, and/or changes in the retail availability of coal-tar-based sealcoat on reducing PAH concentrations in urban water bodies. Research on trends in the occurrence of PCBs and DDTs supports this concern. Following national bans on use of PCBs and DDT in the 1970s, it was 10–15 years before concentrations in lakes and reservoirs decreased by one-half.^{17,55} Unlike these chemicals, all sources of PAHs in urban watersheds will not be eliminated by banning coal-tar-based sealcoat. However, reductions in PAH loads over time might be sufficient to provide more options for disposal of dredged material from stormwater ponds and navigation channels and reduce risk to terrestrial and aquatic ecosystems and human health.

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Notes

The authors declare no competing financial interest.

■ REFERENCES

- (1) Dubey, G. *Understanding how sealcoating works ... and how it can save you money*; <http://pavementpro.org/understanding.htm>.
- (2) Mahler, B. J.; Van Metre, P. C.; Bashara, T. J.; Wilson, J. T.; Johns, D. A. Parking lot sealcoat: An unrecognized source of urban polycyclic aromatic hydrocarbons. *Environ. Sci. Technol.* **2005**, *39*, 5560–5566.
- (3) Van Metre, P. C.; Mahler, B. J.; Wilson, J. T. PAHs underfoot: Contaminated dust from coal-tar sealcoated pavement is widespread in the United States. *Environ. Sci. Technol.* **2009**, *43* (1), 20–25.
- (4) Mahler, B. J.; Van Metre, P. C.; Wilson, J. T.; Musgrove, M.; Burbank, T. L.; Ennis, T. E.; Bashara, T. J. Coal-tar-based parking lot sealcoat: An unrecognized source of PAH to settled house dust. *Environ. Sci. Technol.* **2010**, *44*, 894–900.
- (5) *Polycyclic aromatic hydrocarbons released from sealcoated parking lots – A controlled field experiment to determine if sealcoat is a significant source of PAHs in the environment*; University of New Hampshire Stormwater Center: Durham, NH, 2010.
- (6) Van Metre, P. C.; Mahler, B. J. Contribution of PAHs from coal-tar pavement sealcoat and other sources to 40 U.S. lakes. *Sci. Total Environ.* **2010**, *409*, 334–344.
- (7) Watts, A. W.; Ballesteros, T. P.; Roseen, R. M.; Houle, J. P. Polycyclic aromatic hydrocarbons in stormwater runoff from sealcoated pavements. *Environ. Sci. Technol.* **2010**, *44*, 8849–8854.
- (8) Yang, Y.; Van Metre, P. C.; Mahler, B. J.; Wilson, J. T.; Ligouis, B.; Razzaque, M.; Schaeffer, C.; Werth, C. The influence of coal-tar sealcoat and other carbonaceous materials on polycyclic aromatic hydrocarbon loading in an urban watershed. *Environ. Sci. Technol.* **2010**, *44* (23), 1217–1233.
- (9) *Monographs on the Evaluation of Carcinogenic Risks to Humans Supplement 7: Coal-Tar Pitches (Group 1)*; International Agency for Research on Cancer: Lyon, France, 1987; <http://monographs.iarc.fr/ENG/Monographs/suppl7/Suppl7-57.pdf>.
- (10) *Toxicological profile for wood creosote, coal tar creosote, coal tar, coal tar pitch, and coal tar pitch volatiles*; U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry: Atlanta, GA, September 2002; <http://www.atsdr.cdc.gov/ToxProfiles/tp85.pdf>.
- (11) Scoggins, M.; Ennis, T.; Parker, N.; Herrington, C. A photographic method for estimating wear of coal tar sealcoat from parking lots. *Environ. Sci. Technol.* **2009**, *43* (13), 4909–4914.
- (12) *Reconnaissance study of coal tar sealcoat application in Toronto and an estimate of related PAH emissions*; Diamond Environmental Group, Department of Geography and Department of Chemical Engineering, University of Toronto: Toronto, ON, 2011. Prepared for Environment Canada.
- (13) Rogge, W. F.; Hildemann, L. M.; Mazurek, M. A.; Cass, G. R.; Simoneit, B. R. T. Sources of fine organic aerosol. 3. Road dust, tire debris, and organometallic brake lining dust: roads as sources and sinks. *Environ. Sci. Technol.* **1993**, *27* (9), 1892–1904.
- (14) Yunker, M. B.; Macdonald, R. W.; Vingarzan, R.; Mitchell, R. H.; Goyette, D.; Sylvestre, S. PAHs in the Fraser River basin: A critical appraisal of PAH ratios as indicators of PAH source and composition. *Org. Geochem.* **2002**, *33*, 489–515.
- (15) Van Metre, P. C.; Mahler, B. J.; Furlong, E. T. Urban sprawl leaves its PAH signature. *Environ. Sci. Technol.* **2000**, *34*, 4064–4070.
- (16) Mahler, B. J.; Van Metre, P. C.; Callender, E. Trends in metals in urban and reference lake sediments across the United States, 1970–2001. *Environ. Toxicol. Chem.* **2006**, *25* (7), 1698–1709.
- (17) Van Metre, P. C.; Mahler, B. J. Trends in hydrophobic organic contaminants in urban and reference lake sediments across the United States, 1970–2001. *Environ. Sci. Technol.* **2005**, *39*, 5567–5574.
- (18) Furlong, E. T.; Cessar, L. R.; Hites, R. A. Accumulation of polycyclic aromatic hydrocarbons in acid sensitive lakes. *Geochem. Cosmochim. Acta* **1987**, *51* (11), 2965–2975.
- (19) Gschwend, P. M.; Hites, R. A. Fluxes of polycyclic aromatic hydrocarbons to marine and lacustrine sediments in the northeastern United States. *Geochem. Cosmochim. Acta* **1981**, *45* (12), 2359–2367.
- (20) Scoggins, M.; McClintock, N.; Gosselink, L.; Bryer, P. Occurrence of polycyclic aromatic hydrocarbons below coal-tar-sealed parking lots and effects on stream benthic macroinvertebrate communities. *J. N. Am. Benthol. Soc.* **2007**, *26* (4), 694–707.
- (21) Haeseler, F.; Blancher, D.; Druelle, V.; Werner, P.; Vandecasteele, J.-P. Ecotoxicological assessment of soils of former manufactured gas plant sites: Bioremediation potential and pollutant mobility. *Environ. Sci. Technol.* **1999**, *33* (24), 4379–4384.
- (22) *PAHs in Austin, Texas, Sediments and Coal-Tar Based Pavement Sealants, Polycyclic Aromatic Hydrocarbons*; City of Austin Watershed Protection and Development Review Department: Austin, TX, 2005; http://www.ci.austin.tx.us/watershed/downloads/coaltar_draft_pah_study.pdf.
- (23) The Blacktop Guy - FAQ. <http://www.blacktopguy.com/faq.php#13>.
- (24) A-Line Asphalt Products Frequently Asked Questions. <http://www.alineasphaltproducts.com/faq.html>.
- (25) Selbig, W. R. *Concentrations of Polycyclic Aromatic Hydrocarbons (PAHs) in Urban Stormwater, Madison, Wisconsin, 2005–08*; Open File Report 2009–1077; U.S. Geological Survey: Denver, CO, 2009; <http://pubs.usgs.gov/of/2009/1077/pdf/of20091077.pdf>.
- (26) Polta, R.; Balogh, S.; Craft-Reardon, A. *Characterization of stormwater pond sediments. Final project report*, EQA Report 06–572; Environmental Quality Assurance Department, Metropolitan Council Environmental Services: St. Paul, MN, 2006; <http://www.metrocouncil.org/Environment/sediment/FinalReport.pdf>.
- (27) Whitehead, T.; Metayer, C.; Gunier, R. B.; Ward, M. H.; Nishioka, M. G.; Buffler, P.; Rappaport, S. M. Determinants of polycyclic aromatic hydrocarbon levels in house dust. *J. Expo. Sci. Env. Epid.* **2011**, *21* (March/April), 123–132.
- (28) Van Metre, P. C.; Majewski, M. S.; Mahler, B. J.; Foreman, W. T.; Braun, C. L.; Wilson, J. T.; Burbank, T. Volatilization of polycyclic aromatic hydrocarbons from coal-tar-sealed pavement. *Chemosphere* **2012**, <http://dx.doi.org/10.1016/j.chemosphere.2011.12.072>.
- (29) Van Metre, P. C.; Majewski, M. S.; Mahler, B. J.; Foreman, W. T.; Braun, C. L.; Wilson, J. T.; Burbank, T. PAH volatilization following application of coal-tar-based pavement sealant. *Atmos. Environ.* **2012**, <http://dx.doi.org/10.1016/j.atmosenv.2012.01.036>.
- (30) Douben, P. E. T. *PAHs: An Ecotoxicological Perspective*; John Wiley & Sons Ltd.: West Sussex, England, 2003.
- (31) *Toxicological profile for polycyclic aromatic hydrocarbons*; <http://www.atsdr.cdc.gov/toxprofiles/tp.asp?id=122&tid=25>.
- (32) Van Brummelen, T. A.; et al. Bioavailability and ecotoxicity of PAHs. In *PAHs and Related Compounds. The Handbook of Environmental Chemistry*; Neilson, A.; Hutzinger, O., Eds.; Springer Verlag: Berlin, Germany, 1998; Vol. 3, part J.
- (33) Ireland, D. S.; Burton, G. A. Jr.; Hess, G. G. In situ toxicity evaluations of turbidity and photoinduction of polycyclic aromatic hydrocarbons. *Environ. Toxicol. Chem.* **1996**, *15*, 574–581.
- (34) Diamond, S. A.; Milroy, N. J.; Mattson, V. R.; Heinis, L. J.; Mount, D. R. Photoactivated toxicity in amphipods collected from polycyclic aromatic hydrocarbon-contaminated sites. *Environ. Toxicol. Chem.* **2003**, *22*, 2752–2760.
- (35) Diamond, S. A.; Mount, D. R.; Burkhard, L. P.; Ankley, G. T.; Makynen, E. A.; Leonard, E. N. Effect of irradiance spectra on the photoinduced toxicity of three polycyclic aromatic hydrocarbons. *Environ. Toxicol. Chem.* **2000**, *19*, 1389–1396.
- (36) Ankley, G. T.; et al. Assessing risks from photoactivated toxicity of PAHs to aquatic organisms. In *PAHs: An Ecotoxicological Perspective*; Douben, P. E. T., Ed.; John Wiley & Sons Ltd.: West Sussex, England, 2003; pp 275–296.
- (37) Bryer, P. J.; Elliott, J. N.; Willingham, E. J. The effects of coal tar based pavement sealer on amphibian development and metamorphosis. *Ecotoxicology* **2006**, *15*, 241–247.
- (38) Bommarito, T.; Sparling, D. W.; Halbrook, R. S. Toxicity of coal-tar pavement sealants and ultraviolet radiation to *Ambystoma maculatum*. *Ecotoxicology* **2010**, *19*, 1147–1156.

- (39) Bommarito, T.; Sparling, D. W.; Halbrook, R. S. Toxicity of coal-tar and asphalt sealants to eastern newts, *Notophthalmus viridescens*. *Chemosphere* **2010**, 81 (2), 187–193.
- (40) Bryer, P. J.; Scoggins, M.; McClintock, N. L. Coal-tar based pavement sealant toxicity to freshwater macroinvertebrates. *Environ. Pollut.* **2009**, 158 (5), 1932–1937.
- (41) MacDonald, D. D.; Ingersoll, C. G.; Berger, T. A. Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. *Arch. Environ. Contamin. Toxicol.* **2000**, 39, 20–31.
- (42) Integrated Risk Information System (IRIS); <http://cfpub.epa.gov/ncea/iris/index.cfm>.
- (43) Detection of coal tar materials in asphalt pavements using chemical and biological methods; http://www.asphaltinstitute.org/public/engineering/PDFs/Environmental/Detection_Coal_Tar_Materials_Aspphalt_Pavements_Using_Chem_Bio_Methods.pdf.
- (44) Williams, E. S.; Mahler, B. J.; Van Metre, P. C. Coal-tar pavement sealants might substantially increase children's PAH exposures. *Environ. Pollut.* **2012**, <http://dx.doi.org/10.1016/j.envpol.2012.01>.
- (45) *Exposure Factors Handbook: 2011 ed.*; EPA/600/R-090/052F; U.S. Environmental Protection Agency: Washington, D.C., 2011; <http://www.epa.gov/ncea/efh/pdfs/efh-complete.pdf>.
- (46) Roy, T. A.; Krueger, A. J.; Taylor, B. B.; Mauro, D. M.; Goldstein, L. S. Studies estimating the dermal bioavailability of polynuclear aromatic hydrocarbons from manufactured gas plant tar-contaminated soils. *Environ. Sci. Technol.* **1998**, 32 (20), 3113–3117.
- (47) *An ordinance amending the city code to add a new Chapter 6-6 relating to coal tar pavement products, creating offenses, and providing penalties*, Ordinance No. 2005117-070, 2005; <http://www.ci.austin.tx.us/edims/document.cfm?id=94225>.
- (48) Status of actions regarding use of coal tar-based sealants; <http://www.pca.state.mn.us/index.php/view-document.html?gid=16180>.
- (49) Crane, J. L.; Grosenheider, K.; Wilson, C. B. *Contamination of Stormwater Pond Sediments by Polycyclic Aromatic Hydrocarbons (PAHs) in Minnesota—The Role of Coal Tar-based Sealcoat Products as a Source of PAHs*; Minnesota Pollution Control Agency: St. Paul, MN, 2010, document tdr-gl-07; <http://www.pca.state.mn.us/index.php/view-document.html?gid=12960>.
- (50) Stollenwerk, J.; Smith, J.; Ballavance, B.; Rantala, J.; Thompson, D.; McDonald, S.; Schnick, E. *Managing dredged materials in the State of Minnesota*; Minnesota Pollution Control Agency: St. Paul, MN, 2011, document wq-gen2-01; <http://www.pca.state.mn.us/index.php/view-document.html?gid=12959>.
- (51) South GA Sealcoating and Striping Sealer performance F.A.Q.; http://www.sgasealcoating.com/sealcoating_fa.htm#5.
- (52) A Better Driveway. Driveway sealcoating – now environmentally friendly; http://www.abetterdriveway.com/residential_services.
- (53) Hazardous Waste Recycling Exemptions; <http://www.epa.gov/osw/hazard/recycling/regulations.htm>.
- (54) Valle, S.; Panero, M. A.; Shor, L. *Pollution prevention and management strategies for polycyclic aromatic hydrocarbons in the New York/New Jersey Harbor*; Harbor Consortium of the New York Academy of Sciences: New York, NY, 2007.
- (55) Van Metre, P. C.; Wilson, J. T.; Callender, E.; Fuller, C. C. Similar rates of decrease of persistent, hydrophobic contaminants in riverine systems. *Environ. Sci. Technol.* **1998**, 32 (21), 3312–3317.



City of De Pere

Online Retailer Sealant Review

1.10.h

Location	Product	Type	PAH <0.1%
True Value online	Black Jack Drive Maxx 1000	Asphalt Emulsion	Yes
Ace Hardware	Black Jack Drive Maxx 1000	Asphalt Emulsion	Yes
True Value online	Black Jack Drive Maxx 200	Asphalt Emulsion	Yes
Ace Hardware	Black Jack Drive Maxx 200	Asphalt Emulsion	Yes
True Value online	Black Jack Drive Maxx 500	Asphalt Emulsion	Yes
Ace Hardware	Black Jack Drive Maxx 500	Asphalt Emulsion	Yes
True Value online	Black Jack Drive Maxx 700	Asphalt Emulsion	Yes
Ace Hardware	Black Jack Drive Maxx 700	Asphalt Emulsion	Yes
True Value online	Black Jack pourable driveway crack sealer	Asphalt Emulsion	Yes
True Value online	Driveaseal Driveway Filler Sealer	Asphalt Emulsion	Yes
True Value online	Driveseal Blacktop sealer	Asphalt Emulsion	Yes
Home Depot-GB	Gardner Drive 5	Asphalt Emulsion	Yes
Home Depot-GB	Gardner Pro7	Asphalt Emulsion	Yes
True Value online	Henry Sealer & Dampproofers	Asphalt Emulsion	Yes
Fleet Farm	Jetcoat 1 yr Driveway Sealer	Asphalt Emulsion	Yes
Fleet Farm	Jetcoat 3 yr Driveway Sealer	Asphalt Emulsion	Yes
Fleet Farm	Jetcoat 5 yr Driveway Sealer	Asphalt Emulsion	Yes
Home Depot-GB	Latex-ite Acrylic Plus	Acrylic	Yes
Home Depot-GB	Latex-ite Airport Grade	Asphalt Emulsion	Yes
Home Depot-GB	Latex-ite Optimum	Asphalt Emulsion	Yes
Home Depot-GB	Latex-ite Ultra Shield	Asphalt Emulsion	Yes
Home Depot-GB	Lift Driveway Overlay Sealer	Acrylic	Yes
Home Depot-GB	Plushtex Asphalt Resurfacer	Asphalt Emulsion	Yes
Menards De Pere	Rustoleum Epoxyshield	Acrylic	Yes
Home Depot-GB	Rustoleum Epoxyshield	Acrylic	Yes
Home Depot-GB	Latex-ite Color Grade Blacktop Sealer	Petroleum Emulsion	No
Home Depot-GB	Latex-ite Drive-Top Sealer	Petroleum Emulsion	No
Home Depot-GB	Latex-ite Therma Seal	Petroleum Emulsion	No
True Value online	Sakrete Blacktop Sealer	Tar emulsion	No



City of De Pere, Wisconsin

Request For Common Council Action

MEETING DATE: November 17, 2020

DEPARTMENT: Board of Public Works

FROM: Scott Thoresen

SUBJECT: Res #20-118 Preliminary Resolution Declaring Intention to Exercise Special Assessment Powers Under Section 66.0703, Wis. Stats., Sanitary Sewer and Water Main, Storm Sewer and Storm Water Management (Garroman Drive).

The Board of Public Works at the November 9, 2020 meeting approved the preliminary resolution for special assessment for sanitary sewer and water main, storm sewer, and storm water management for Garroman Drive, Parcel WD-L482-1 (2535 Lawrence Drive), with interest deferred for two years and moved to send it to the Common Council for approval. The motion passed with a 5-0 vote.

ATTACHMENTS:

- Reso20-118 (DOCX)
- 2020 1109 CI-BOPW-Garroman Special Assessment (PDF)
- GARRITYS GLEN ASSEMENT EXHIBIT (PDF)
- CI-CALC-Schedule B Garroman Assessment (PDF)
- CI-CALC-Schedule C Garroman Assessment (PDF)
- CI-CALC Schedule D Garroman Assessment (PDF)

RESOLUTION #20-118

PRELIMINARY RESOLUTION DECLARING INTENTION TO EXERCISE
SPECIAL ASSESSMENT POWERS UNDER SECTION 66.0703, WIS. STATS.
SANITARY SEWER, WATER MAIN, STORM SEWER AND STORM WATER MANAGEMENT
(Garroman Drive)

BE IT HEREBY RESOLVED, by the Common Council of the City of De Pere, Wisconsin, as follows:

1. That the Common Council hereby declares its intention to exercise its police powers and levy special assessments pursuant to Section 66.0703, Wis. Stats., for improvements constructed within the area described below and special assessments to be levied on a reasonable basis upon the properties benefited thereby. Said improvements to include sanitary sewer, water main, storm sewer, and storm water management system construction. Said improvements shall be constructed and the properties benefiting there from are contained in the following described areas or abutting street:

SANITARY SEWER, WATER MAIN, STORM SEWER, AND STORM WATER MANAGEMENT SYSTEMS – GARROMAN DRIVE

South side of Garroman Drive from Lawrence Drive to 520 feet east of Lawrence Drive

2. The total assessed against such districts shall not exceed the total cost of the improvements. The sanitary sewer, water main, storm sewer and storm water management systems shall be assessed against developable or developed parcels that do not currently have the improvements. The Common Council determines that such improvements shall be installed and assessed therefore levied under the police power and that the amount assessed against each benefited parcel shall be based on the linear foot of frontage for the sanitary sewer, water main and storm sewer and based on the parcel area for storm water management.

3. The assessments against any parcel shall be paid as follows:
- (a) Assessment shall be deferred up to two years;
 - (b) No interest imputed if payment of assessment made in full within two years of the date of the invoice;
 - (c) Payment shall be in _____ (To be determined by the Council) yearly installments once the assessment is due, together with interest on the unpaid balance thereon at the rate of one percent over the interest rate paid by the city on its latest bonding issue, with payment in full due upon transfer of the property;
 - (d) Upon transfer of ownership of any parcel or part of a parcel against which assessments are levied. If title to part of such parcel is transferred, only such assessments that are attributable to part transferred shall become due and payable upon transfer.

4. The Director of Public Works is directed to prepare a report incorporating the recommendation of the Board of Public Works consisting of:

- (a) Preliminary plans and specifications for said improvements;
- (b) An estimate of the entire cost of the proposed improvements;
- (c) A schedule of the proposed assessments;
- (d) A statement that the property against which the assessments are proposed is benefited.

After compiling such report, the Director of Public Works is directed to file a copy thereof in the City Clerk-Treasurer's office for public inspection.

5. Upon receiving the report of the Board of Public Works, the Clerk-Treasurer is directed to give a Class I notice of public hearing on such report as specified in Section 66.0703,

Resolution #20-118

Page **3** of **3**

Wis. Stats. The hearing shall be held in the Common Council Chambers of the City Hall at a time set by the Clerk-Treasurer in accordance with the aforementioned statutory provision.

Adopted by the Common Council of the City of De Pere, Wisconsin, this 17th day of November, 2020.

APPROVED:

James G. Boyd, Mayor

ATTEST:

Carey E. Danen, City Clerk

Ayes: _____

Nays: _____

Board/Committee Approval: 11/09/20

CITY OF DE PERE MEMO



To: Honorable Mayor Boyd
Members of the Board of Public Works

From: Eric P. Rakers, P.E., City Engineer

Date: November 9, 2020

RE: Consideration and possible action on Preliminary Resolution for Special Assessment for Garroman Drive*

Garrity's Glen Subdivision, Fourth Addition was constructed in 2019 and 2020. The purpose for this item is to special assess improvements for Parcel WD-L482-1(2535 Lawrence Drive) that was not developed with the subdivision, but benefits from infrastructure installed on Garroman Drive for the subdivision.

Recommendation

In 2019 and 2020, Garroman Drive was extended adjacent on the north property line of WD-L482-1 (2535 Lawrence Drive). At the beginning of the project, the City had been in discussions to acquire right of way from 2535 Lawrence Drive in exchange for the cost of utility extensions (south half of right of way). That agreement never came to fruition and the City constructed the road on the north half of the right of way.

As part of the Garroman Drive extension; sanitary, water main, and storm sewer were constructed adjacent to 2535 Lawrence Drive. In addition to the utilities, a storm water management pond was constructed downstream of the storm sewer. These facilities will ultimately provide service to 2535 Lawrence Drive in the future. As such, part of the costs associated for the mainline construction of sanitary sewer, water main, storm sewer, and pond are being assessed against the property. The proposed assessments are as follows:

- Sanitary Sewer and Water Main - \$36,979.10
- Storm Sewer - \$17,088.03
- Storm Water Management - \$4,912.44

There will be future charges for the parcel when developed including the construction of the remaining portion of Garroman Drive, sanitary and storm laterals, and water services.

Staff is proposing to defer the costs for five years with no interest.

Recommendation

Staff recommends that the Board adopt the preliminary resolution to the Common Council to schedule a public hearing. The property should be included in the assessment schedule.

Attachments:

- Resolution #20 – Garroman Preliminary Resolution (PDF)
- Special Assessment Boundary Map (PDF)
- Schedule B, C, & D Sanitary Sewer (PDF)

GARROMAN DRIVE ASSESSMENT AREA

GARRITYS GLEN
SOUTH SUBDIVISION

ASSESSMENT
AREA



1 inch = 250 feet



Engineering Division
925 S. 6Th St.
De Pere, WI 54115
Office: 920-339-4061
Fax: 920-339-4071

Garroman Drive
Assessment
Area

Project:
19-11

11-2020

Packet Pg. 121

SCHEDULE B
COST OF PROPOSED IMPROVEMENTS
GARROMAN DRIVE ASSESSMENTS
GARRITY'S GLEN SOUTH SUBDIVISION-UTILITIES AND POND
September 9, 2020

UTILITY AND STORM WATER MANAGEMENT POND COST ALLOCATION

NOTE: DOES NOT INCLUDE CONTINGENCY

Main Line Sanitary Sewer and Water Main

No.	Item	Unit	Final Amount	Unit Price	Total Cost	Assessable
Sanitary Sewer						
SS-01	Provide 8" PVC Sanitary Sewer	LF	3959	\$65.00	\$257,335.00	\$257,335.00
SS-08	Provide 4' Diameter Sanitary Sewer Manhole	VF	192.33	\$264.00	\$50,775.12	\$50,775.12
SS-09	Core Drill Sanitary Manhole	EA	1	\$3,000.00	\$3,000.00	\$3,000.00
SC-08	Reconstruct Manhole	VF	7.5	\$250.00	\$1,875.00	\$1,875.00
Water Main						
W-01	Provide 12" PVC Water Main (Granular Backfill)	LF	122	\$58.00	\$7,076.00	\$7,076.00
W-02	Provide 8" PVC Water Main (Granular Backfill)	LF	245	\$46.00	\$11,270.00	\$11,270.00
W-04	Provide 12" PVC Water Main (Natural Backfill)	LF	1101.5	\$40.00	\$44,060.00	\$44,060.00
W-05	Provide 8" PVC Water Main (Natural Backfill)	LF	3331	\$26.00	\$86,606.00	\$86,606.00
W-10	Provide 2" Corporation with Plug/Saddle with 2" HDPE	EA	2	\$1,276.00	\$2,552.00	\$2,552.00
W-11	Provide 12" Gate Valve	EA	2	\$2,843.00	\$5,686.00	\$5,686.00
W-12	Provide 8" Gate Valve	EA	9	\$1,677.00	\$15,093.00	\$15,093.00
W-13	Provide 6" Gate Valve	EA	3	\$1,226.00	\$3,678.00	\$3,678.00
W-15	Provide Connection to Existing Water Main	EA	2	\$1,500.00	\$3,000.00	\$3,000.00
W-16	Provide Connection to Existing Water Main 12"x 12" Tapping Tee and Valve	EA	1	\$6,500.00	\$6,500.00	\$6,500.00
W-17	Provide Hydrant (6.5' Bury)	EA	11	\$3,950.00	\$43,450.00	\$43,450.00
W-18	Provide 6" PVC Hydrant Lead	LF	60	\$31.00	\$1,860.00	\$1,860.00
W-19	Provide Water Main Offset	EA	3	\$3,000.00	\$9,000.00	\$9,000.00
W-21	Remove Hydrant	EA	2	\$550.00	\$1,100.00	\$1,100.00
Sub-Total					\$553,916.12	\$553,916.12
Technical, Legal, and Administration					\$110,783.22	\$110,783.22
Total Cost					\$664,699.34	\$664,699.34
Total Project Cost					\$664,699.34	

Main Line Storm Sewer

No.	Item	Unit	Final Amount	Unit Price	Total Cost	Assessable
ST-01	Provide 36" RCP Class III Storm Sewer (Granular Backfill)	LF	189	\$62.00	\$11,718.00	\$11,718.00
ST-02	Provide 30" PVC, RCP Class III, or PP Storm Sewer (Granular Backfill)	LF	327	\$52.00	\$17,004.00	\$17,004.00
ST-03	Provide 24" PVC, RCP Class III, or PP Storm Sewer (Granular Backfill)	LF	122	\$43.00	\$5,246.00	\$5,246.00
ST-04	Provide 21" PVC or RCP Class III Storm Sewer (Granular Backfill)	LF	649	\$41.00	\$26,609.00	\$26,609.00
ST-05	Provide 18" PVC or RCP Class III Storm Sewer (Granular Backfill)	LF	584	\$38.00	\$22,192.00	\$22,192.00
ST-06	Provide 15" PVC or RCP Class III Storm Sewer (Granular Backfill)	LF	897	\$36.00	\$32,292.00	\$32,292.00
ST-07	Provide 12" PVC or RCP Class III Storm Sewer (Granular Backfill)	LF	1559	\$31.00	\$48,329.00	\$48,329.00
ST-08	Provide 8" PVC Storm Sewer (Granular Backfill)	LF	1320	\$26.00	\$34,320.00	\$34,320.00
ST-10	Provide 36" RCP Class III Storm Sewer (Natural Backfill)	LF	26.5	\$56.00	\$1,484.00	\$1,484.00
ST-11	Provide 15" PVC or RCP Class III Storm Sewer (Natural Backfill)	LF	165	\$28.00	\$4,620.00	\$4,620.00
ST-19	Provide 6' Diameter Storm Manhole	VF	12.53	\$514.00	\$6,440.42	\$6,440.42
ST-20	Provide 5' Diameter Storm Manhole	VF	24.19	\$474.00	\$11,466.06	\$11,466.06
ST-21	Provide 4' Diameter Storm Manhole	VF	144.08	\$383.00	\$55,182.64	\$55,182.64
ST-24	Connect to Structure and/or Existing Pipe	EA	1	\$1,500.00	\$1,500.00	\$1,500.00
ST-25	Core Drill Existing Structure	EA	1	\$2,000.00	\$2,000.00	\$2,000.00
ST-27	Provide 36" RCP Endwall	EA	1	\$1,283.00	\$1,283.00	\$1,283.00
ST-28	Provide 15" RCP Endwall	EA	1	\$474.00	\$474.00	\$474.00
ST-29	Abandon/Remove Existing Storm Sewer Appurtenances	LS	1	\$2,000.00	\$2,000.00	\$2,000.00
Sub-Total					\$284,160.12	\$284,160.12
Technical, Legal, and Administration					\$56,832.02	\$56,832.02
Total Cost					\$340,992.14	\$340,992.14
Total Project Cost					\$340,992.14	

Storm Water Management Pond

No.	Item	Unit	Final Amount	Unit Price	Total Cost	Assessable
ST-09	Provide 60" RCP Class III Storm Sewer (Natural Backfill)	LF	46	\$127.00	\$5,842.00	\$5,842.00
ST-26	Provide 60" RCP Endwall	EA	2	\$2,932.00	\$5,864.00	\$5,864.00
SD-03	Unclassified Excavation (Pond)	CY	32500	\$4.10	\$133,250.00	\$133,250.00
SD-14	Landscaping – Topsoil, Seed, Fertilizer and Erosion Mat	SY	8833.67	\$3.55	\$31,359.53	\$31,359.53
SC-02	Provide Silt Fence	LF	400	\$2.04	\$816.00	\$816.00
SC-05	Provide Heavy Rip Rap w/ Geotextile Fabric (Type HR)	SY	819.86	\$39.00	\$31,974.54	\$31,974.54
	Rock Bag	EA	7	\$15.00	\$105.00	\$105.00
	Topsoil	SY	36443	\$0.74	\$26,967.82	\$26,967.82
	Temp Seed W/O Mulch	SY	13566	\$0.30	\$4,069.80	\$4,069.80
Sub-Total					\$240,248.69	\$240,248.69
Technical, Legal, and Administration					\$48,049.74	\$48,049.74
Total Cost					\$288,298.43	\$288,298.43
Total Project Cost					\$288,298.43	
Total					\$1,293,989.91	

SCHEDULE C
PROPOSED ASSESSMENT RATES
GARROMAN DRIVE ASSESSMENT
GARRITY'S GLEN SOUTH SUBDIVISION-UTILITIES AND POND
September 9, 2020

ASSESSMENT RATE CALCULATION - MAIN LINE SANITARY SEWER, WATER MAIN, AND STORM SEWER

Improvement	Unit Type	Number of Units	Total Cost (Assessable)	Cost per Front Foot
Sanitary Sewer and Water Main	LF	8980.68	\$664,699.34	\$74.01
Storm Sewer	LF	9969.16	\$340,992.14	\$34.20

Notes:

(1) Sanitary sewer, water main, and storm sewer are based on front foot of Garrity's Glen South Plat.

ASSESSMENT RATE CALCULATION - STORM WATER MANAGEMENT POND

Land Use	Unit Type	Number of Units	WDNR Pool Surface (1)	Weighted Area (Acre)
Single Family Residential Development	Acre	32.18	0.8	25.74
Multi Family Residential Development	Acre	4.44	1.0	4.44
Industrial Development	Acre	57.17	2.1	120.06
Total		93.79		150.24
Assessable Pond Cost				\$288,298.43
Cost per Weighted Area (Acre)				\$1,918.92

Notes:

(1) Calculation is based on surface area percentage from the WDNR Wet Detention Standard for Wet Pond Construction (1001), Appendix A - Calculation of Preliminary Pool Surface Area for TSS Reduction

PROBABLE PROJECT FINANCING

Description	Unit Type	Units	Cost/ Unit	Total
Sanitary Sewer and Water Main	LF	8980.68	\$74.01	\$664,660.13
Storm Sewer	LF	9969.16	\$34.20	\$340,945.27
Storm Water Management Pond				
- Single Family Residential	Weighted Acre	25.74	\$1,918.92	\$49,393.00
- Multi Family Residential	Weighted Acre	4.44	\$1,918.92	\$8,520.00
- Industrial Development	Weighted Acre	120.06	\$1,918.92	\$230,385.54
Total Estimated Project Cost				\$1,293,903.94

SCHEDULE D - SCHEDULE OF PROPOSED ASSESSMENTS

PRELIMINARY ASSESSMENTS - SEPTEMBER 9, 2020

TYPE OF IMPROVEMENT: MAIN LINE SANITARY SEWER, WATER MAIN, AND STORM SEWER AND STORM WATER MANAGEMENT CONSTRUCTION

GARROMAN DRIVE ASSESSMENTS

LOCATION - GARRITY'S GLEN SOUTH SUBDIVISION

SCHEDULE INCLUDES MAIN LINE UTILITIES ONLY AS NO LATERALS WERE STUBBED TO PARCEL WD-L482-1

2019/2020 EXPENSES

MAINLINE SANITARY SEWER AND WATER MAIN COST	\$74.01	LF
MAINLINE STORM SEWER COST	\$34.20	LF
COST PER WEIGHTED ACRE - STORM WATER MANAGEMENT	\$1,918.92	Acre

PROPERTY OWNER	LOT NO. PROPERTY ADDRESS PARCEL NUMBER	MAINLINE SANITARY SEWER AND WATER MAIN		MAINLINE STORM SEWER		ACRES			WEIGHTED ACRES (See Schedule C)			STORM WATER MANAGEMENT						TOTAL ASSESSMENT
		UNIT	COST	UNIT	COST	UNIT-SF (Acre)	UNIT-MF (Acre)	UNIT-IN (Acre)	UNIT-SF (Acre)	UNIT-MF (Acre)	UNIT-IN (Acre)	SINGLE FAMILY		MULTI FAMILY		INDUSTRIAL		
												UNIT	COST	UNIT	COST	UNIT	COST	
GARRITY'S GLEN SOUTH SUBDIVISION (Charged through Developer's Agreement)	WD-L482	8481.03	\$627,681.03	9469.51	\$323,857.24	28.98	4.44	0.00	23.18	4.44	0.00	23.18	\$44,480.57	4.44	\$8,520.00	0.00	\$0.00	\$1,004,538.84
G&G REBUILDERS	WD-L482-1	499.65	\$36,979.10	499.65	\$17,088.03	3.20	0.00	0.00	2.56	0.00	0.00	2.56	\$4,912.44	0.00	\$0.00	0.00	\$0.00	\$58,979.57
WD-L484-1, WD-L483-1, WD-L482-2, WD-L514, WD-515, L517 (Area Identified on Map) - TID Funded		0	\$0.00	0	\$0.00	0.00	0.00	57.17	0.00	0.00	120.06	0.00	\$0.00	0.00	\$0.00	120.06	\$230,385.54	\$230,385.54
	TOTAL	8,980.68	\$664,660.13	9,969.16	\$340,945.27	32.18	4.44	57.17	25.74	4.44	120.06	25.74	\$49,393.01	4.44	\$8,520.00	120.06	\$230,385.54	\$1,293,903.95

Note:
(1) SF is single family, MF is multi family, and IN is industrial development.



City of De Pere, Wisconsin

Request For Common Council Action

MEETING DATE: November 17, 2020

DEPARTMENT: Economic Development

FROM: Daniel Lindstrom

SUBJECT: Resolution #20-119 Establishing Pandemic Response - Downtown Business Aid Program

The Finance and Personnel Committee unanimously recommended approval of the Pandemic Response - Downtown Business Aid Program. The Committee members requested a the Main Street District map be included in the program. A map has been included in the packet.

ATTACHMENTS:

- Reso20-119 (PDF)
- Downtown Business Aid Memo 11102020 (updated 11122020)(PDF)
- Main_Street_Boundary2020 (PDF)
- Business Walk Results 2020 Final (PDF)

RESOLUTION #20-119
ESTABLISHING PANDEMIC RESPONSE – DOWNTOWN
BUSINESS AID PROGRAM

WHEREAS, on March 12, 2020, Governor Evers declared a Health Emergency exists in the State of Wisconsin and on March 17, 2020, the Common Council adopted Resolution #20-24 Declaring a State of Emergency in the City of De Pere in response to the COVID-19 pandemic; and

WHEREAS, the emergency powers granted to the Common Council under Wis. Stats. §323.14 include the general authority to order, by ordinance or resolution, whatever is necessary and expedient for the health, safety, protection and welfare of persons and property within the City in the emergency; and

WHEREAS, in order to protect the health and well-being of the residents, business owners, property owners, visitors and frequenters in the City of De Pere, the City must avail itself of all resources needed to respond to this ongoing emergency; and

WHEREAS, De Pere's downtown businesses, which are vital to a live and vibrant commercial business district, have been instrumental in creating the city's community character and its unique mix of locally-grown commercial, office, entertainment and hospitality businesses; and

WHEREAS, City's 240 downtown small businesses have been particularly hard hit by the COVID-19 pandemic, and the upcoming harsh winter months will continue to negatively impact business operations with outdoor dining limitations and indoor capacity; and

Resolution #20-119
Page 2 of 3

WHEREAS, results from the recent “Business Talk” sponsored by the De Pere Chamber, in partnership with Definitely De Pere, the City of De Pere and the Wisconsin Development Corporation, indicate that 29% of businesses are highly uncertain about the future, while 8% anticipate a lack of viability within 3 months and additional 12% within 6 months, if circumstances do not improve; and

WHEREAS, funding in the amount of \$300,000 for a downtown business aid program will enable the City to provide a conditioned grant in an amount up to \$5,000 for eligible businesses to help offset rent or mortgage payments or for working capital to support payroll expenses, utility expenses, inventory or similar expenses occurring in the ordinary course of business over the winter months; and

WHEREAS, as part of the disbursement agreement, businesses that do not remain open until the conclusion of the aid program period will be required to return a prorated portion of the funds to the City; and

WHEREAS, this request has been reviewed by the Finance/Personnel Committee, which recommends approval thereof; and

NOW, THEREFORE, BE IT HEREBY RESOLVED THAT:

The Common Council hereby authorizes the establishment of a Pandemic Response – Downtown Business Aid (PR-DBA) program to assist downtown business in the form of a conditioned grant in the maximum amount of \$5,000 per eligible business.

Resolution #20-119
Page 3 of 3

BE IT FURTHER RESOLVED THAT:

As authorized by Resolution #19-85, the funds for the PR-DBA program shall be drawn from the designated Revolving Loan Fund established upon the closure of the Community Block Grant Funded Revolving Loan Fund Program.

BE IT FURTHER RESOLVED THAT:

All City officials, officers, and employees are authorized and directed to take such steps as are lawful and necessary in furtherance thereof.

Adopted by the Common Council of the City of De Pere, Wisconsin, this 17th day of November, 2020.

APPROVED:

James G. Boyd, Mayor

ATTEST:

Carey E. Danen, City Clerk

Ayes: _____

Nays: _____

Committee Approval: 11/10/2020

CITY OF DE PERE MEMO



To: Mayor James Boyd
Larry Delo, City Administrator

From: Daniel Lindstrom, Development Services Director

Date: November 10, 2020 (updated 11/12/2020)

RE: **De Pere – Pandemic Response - Downtown Business Aid**

The City of De Pere residents take pride in knowing our Downtown is the heart of the community and the small local businesses are vital to maintaining our community character. The City values our small businesses and recognizes that smaller-scale retail and local restaurant businesses in the downtown continue to be significantly impacted by the COVID-19 emergency. As a result of the ongoing COVID-19 pandemic, the City of De Pere proposes an aid program to provide financial assistance to the City's downtown small retail, restaurant, entertainment venue, businesses to assist them through the harsh winter months where outdoor dining and limited capacity requirements continue to impact business operations. The City anticipates allocating \$300,000 in funds. We should be focused on getting these local funds out quickly to our downtown businesses to help them in these challenging times. While the City wishes it could help out every business we are limited by available resources to make a meaningful impact. Therefore, the aid program is targeted around the Downtown/Main Street District. Applications to the aid program will be accepted starting at 8:00 am on Tuesday, December 1, 2020, and will close at 4:00 pm on Friday, December 18, 2020. Businesses must be located within the City of De Pere Main Street District and meet the other eligibility requirements to be eligible for the program. Businesses that received Definitely De Pere and/or De Pere Chamber of Commerce Relief Grants may also apply to this new aid program.

A summary of the existing and proposed City of De Pere locally funded COVID response programs are as follows:

NEW: Pandemic Response - Downtown Business Aid (PR- DBA)

Provide a grant up to \$5,000 in aid for small retail, restaurants, and entertainment establishments throughout the City of De Pere Main Street District/Business Improvement District.

EXISTING: Small Business Pandemic Response Loan (SB-PRL):

Provide up to \$10,000 for small business loans to eligible small businesses to be used to provide zero-interest loans with flexible repayment terms to support certain small business activities throughout the City of De Pere that have realized a significant financial hardship as a result of the COVID-19 pandemic. Loans to eligible businesses/borrowers must be \$5,000 or more and are capped at \$10,000. The City still has \$205,000 in available funding.

EXISTING: City of De Pere Revolving Loan Fund:

The City of De Pere will defer Revolving Loan Fund (RLF) payments for up to 120 days upon request from any businesses with outstanding loans provided the company can demonstrate an income loss as a result of the COVID-19 outbreak. Principal and interest payments will be deferred while the outstanding balance will continue to incur interest.

Staff is also preparing a downtown business recruitment or "Jump-Start" grant program to encourage new businesses to start or move into downtown. Staff anticipates presenting the program to the Common Council in January 2021.



Pandemic Response - Downtown Business Aid (PR-DBA)

Program Goal:	To provide existing retail, restaurants and taverns, and selected personal service businesses with financial aid in the form of a grant to assist them through the harsh winter months where outdoor dining and limited capacity requirements continue to impact business operations.
Funding Source:	Former City of De Pere CDBG-RLF (CDBG-Close)
Program Funding Amount:	\$300,000
Availability:	Applicant awards will be up to \$5,000 depending on the number of applications received.
Overview:	Aid is in the form of a conditioned grant to help offset rent or mortgage payments, but also may be used for working capital to support payroll expenses, utility expenses, inventory, or other similar expenses that occur in the ordinary course of business. Grant awards will be provided directly to the business entity. If an awarded business owns the building it occupies they will be required to sign a grant disbursement agreement that requires the business to notify the City if the business is no longer in operation at the end of each month. If the awarded business leases the space it occupies then the landlord will also be required to sign a grant disbursement agreement that requires the City to be notified if the business is no longer in operation at the end of each month. As part of the grant agreement, if a business closes then it shall return a prorated amount of the grant calculated for each day they closed before the grant period concludes. For the purposes of this program, the grant period is from January 1, 2021, to May 31, 2021 (150 Days).
Eligible Businesses:	Eligible Business means a business in an industry outlined in any Emergency Order or demonstrates it is otherwise affected by the COVID-19 outbreak. Eligible businesses must demonstrate the following: • The business must have a physical storefront or location within the De Pere Main Street District/Business Improvement District. • The business must be able to demonstrate the negative hardship that COVID-19 continues to put onto their business. • The applicant must be a locally owned business. • Must be an established business before December 1, 2020. • Have fewer than 20 FTE employees. • Business Type: Retail, restaurants and taverns, and entertainment venue businesses. For reference, eligible business shall fall under a 6 digit NAICS Industry Codes beginning with - o Retail - 445, 446, 448, 451, 452, 453 - o Entertainment Venues - 711 - o Restaurants/Bars - 722
Ineligible Businesses:	General or professional offices use not typically impacted by spacing and capacity restrictions, property management/landlord for either commercial and/or residential customers, any speculative venture, investment venture, research and development, or home-based occupations. Businesses must be in good standing. Any business with citations and fines within the last six months will not be eligible for business aid.
Eligible Uses:	Grants shall be primarily used for rent or mortgage reimbursement, but also may be used for working capital to support payroll expenses, utility expenses, inventory, purchase of equipment and expenditures to manage COVID-19 outbreak (tents, heaters, Plexiglas dividers, etc.), or other similar expenses that occur in the ordinary course of business. Applicants are encouraged to also work with landlords and mortgage institutions to arrange rent reductions and/or payment deferrals.

Ineligible Uses: Grants shall not be used for reimbursement of expenses incurred before the COVID-19 crisis, any pay off non-business or personal debt, or construction and/or physical property improvements not related to COVID-19 mitigation efforts.

Grant Application Period: 8:00 am December 1, 2020 to 4:00 pm December 18' 2020.

Approval: Submission of an application does not guarantee to fund, and all applications will be reviewed by the review committee. Any applicant can decrease or decline funding upon notification of approval. In the case of receiving more grant applications than funding allows, the grant review team will review based on the following criteria.

Scoring System	1 Point	2 Points	3 Points	Rationale
Years of Operation	<1 Year	2-4 Years	5+ Years	We care about supporting small businesses that are anchors in their communities. Years of operation is a proxy variable for this.
Minority, Women, and Disadvantaged Business Enterprises	No minority ownership	-	If at least one owner is M/W/DBE	Minority, Women, and Disadvantaged Business Enterprises have less of a cash buffer in the bank than other companies. This loan aims to stabilize small businesses, therefore the scoring rubric reflects this cash gap.
Gross Receipts	<\$100K	\$100K - \$300k	\$300K+	This score is designed to reflect the contribution to the tax base. These thresholds should change based on metro area. The following ranges are generated for mid-sized metros.
Fiscal Stability (% of funding in the bank to cover operational expenses on a monthly basis)	Less than 25%	25-75%	75-100%	We want to make sure that we are allocating scarce funding to viable businesses, so we want to understand how much cash small businesses have in their accounts.
Business Size	11-20 Employees	6-10 Employees	5 or fewer Employees	The smallest businesses are most likely to fall through the cracks of SBA lending. We want to ensure that they get the support they need.
To what extent does this small business have a vital economic role in its community?	This business followed existing development and is not an anchor of the community it resides in	This business partially plays a role in the downtown. The business has community supporting services	This business played a vital role in the downtown and has or is catalyzing development around it	Geography matters--ideally we are stabilizing neighborhood businesses that serve as important
To what extent has this small business demonstrated adaptability by reconfiguring its existing business model to meet the demands for COVID-19?	This small business has not re-configured its business model and does not demonstrate adaptability	This small business is in the process of re-configuring its business model in a way that demonstrates its adaptability	The small business has demonstrated an ability to re-configure its business model in a way that demonstrates its adaptability	Adaptability. The small businesses that are reconfiguring their business models are more likely to endure COVID-19 and remain open after the crisis.
To what extent will this funding serve as a bridge for the small business to a more stable economic cycle after the Covid-19 pandemic?	It's unlikely that this funding will meaningfully establish a bridge to a more stable business cycle	This funding is likely to establish a bridge to a more stable business cycle	This funding will meaningfully establish a bridge to a more stable business cycle	This fund is designed to serve as bridge funding to more stable economic cycles.

Pandemic Response - Downtown Business Aid (PR-DBA) Application Process

Applicants shall complete the following information:

- 1) Application
- 2) Business Summary. Provide a brief, less than one page, overview of your business. At a minimum, the business summary should include:
 - a. History of the company's operations
 - b. Business physical address
 - c. Ownership structures and any authorized agent
 - d. Include the number of full-time and part-time employees
- 3) Demonstrate why aid is needed (please attach additional pages if necessary)
- 4) Explain any other factors that should be considered in evaluating this request

Pandemic Response - Downtown Business Aid (PR-DBA) Review Steps

- 1) Applicants shall review the entire program, application, and draft Aid agreement.
- 2) Review the entire program business operation
- 3) Applicants are encouraged to contact the City of De Pere staff prior to applying for assistance to ask questions regarding the application or approval process.
- 4) Applicants shall submit the application directly to the Development Services Director by email (dlindstrom@deperewi.gov) or by mail (335 S. Broadway Street, De Pere, WI 54115)
- 5) City staff will review the application and verify application information before award determination.
- 6) City of De Pere staff will notify grant applicants whether they will receive a grant award and, if so, of the grant distribution processes.

BUSINESS OPERATION TIPS FOR LOCAL BUSINESS DURING COVID-19 PANDEMIC

- If your business is staying open, publish commitment to public health and outline actions for ensuring a clean facility and healthy staff; have hand sanitizer available for customers and latex gloves available for employees.
- Offer digital gift cards that customers and patrons can buy now and use later.
- Start, maintain, and enhance business webpages, online shopping opportunities, and social media presence. Make sure to update Google with modified hours of operation.
- Keep customers updated on new experiences or products you'll offer when conditions improve.
- Develop customer membership programs, such as "subscribe and save" on delivery or pickup of coffee beans, fresh produce, etc.
- Develop online shopping list services. For example, many grocery stores offer grocery pickup or delivery to customers who submit shopping lists online.
- Offer digital services and support to virtually sell, answer questions, and provide customer service.
- For experience-based businesses, offer digital services such as web-based classes (yoga, painting, etc.), restaurants offer cooking classes, etc.
- Keep it lively! Offer trivia nights via live stream and provide virtual tours of your shop.

Restaurant-Specific Suggestions

- Provide food-to-go or home delivery.
- Use single-service items such as silverware, condiments, etc. for take-out orders.
- Provide online or telephone order and payment options to limit cash handling and in-person ordering of food. Promote "tap and pay" or payment transfer methods like PayPal.
- Dedicate staff for in-person transactions. This individual would not make or assist in foodservice operations.
- Gloves must be worn by individuals preparing or handling ready to eat food. If gloves are worn for additional activities, such as cash handling, these individuals must wash their hands before putting a new pair on or after taking a pair off.
- Retrain employees on proper handwashing and encourage them to wash their hands more frequently, especially after making contact with items used by guests.
- Increase the frequency of cleaning and sanitizing all common areas in your facility. Pay special attention to frequently touched surfaces such as door handles, workstations, tables, chairs, menus, condiments, credit card machines, etc.
- Ensure the proper sanitizing concentrations are being used in all cleaning products. Make sure to follow all label guidelines or these products.
- Make sure sick employees stay home. If an employee suspects they might have COVID-19, please have them contact the Health Department for further instruction. Ensure that all staff understands your facility's sick leave policy. Per the 2013 FDA Food Code, employees must be restricted from working in any foodservice establishment if they have a sore throat and fever.

COVID 19 - Develop Business Continuity/Contingency Plan Suggestions

1. **Evaluate Expenses and Borrowing Capabilities.** Contact your financial institutions to understand current lending capabilities and make any necessary arrangements. Take inventory and understand your current monthly expenses. Consider prioritizing payments based on size, due date, and disaster assistance related support offerings.
2. **Double Check Your Insurance Coverage.** You may have business interruption insurance coverage. Contact your insurance agent to review your policy and understand what you are covered for.
3. **Anticipate Inventory and Supply Chain Disruptions.** Identify your key partners, suppliers, and contractors and contact them to anticipate any delays or shortages. Identify the raw materials your business needs to function. Ensure you have adequate supplies of inventory for a sustained period of 30 days. If necessary, diversify distributor sources.
4. **Avoid Scams.** Encourage all employees to verify the legitimacy of emails, phone messages, text messages, bills, etc.
5. **Review Employment Policies and Procedures.** Review, update and communicate your employee leave policies and procedures. Implement a flexible workplace and leave policies. Additionally, do not require a healthcare provider's note for employees who are sick to validate their illness or to return to work, as healthcare provider offices and medical facilities may be extremely busy and not able to provide such documentation in a timely way.

Anticipate absenteeism and plan to backfill positions if employees are absent. It is essential to cross-train employees to carry out essential functions. Unemployment will create an economic hardship; therefore, consider alternative ways to keep employees employed, such as temporarily reduced pay or permit flexible work hours like staggered shifts. Where and when appropriate, update all employee contact information and share it with your team.

6. **Establishing a Marketing and Communication Plan.** Minimize impact on your customers and business partners by communicating with your customers about the status of your operations. Considering offering creative and incentivizing reasons for customers to patronize your business.

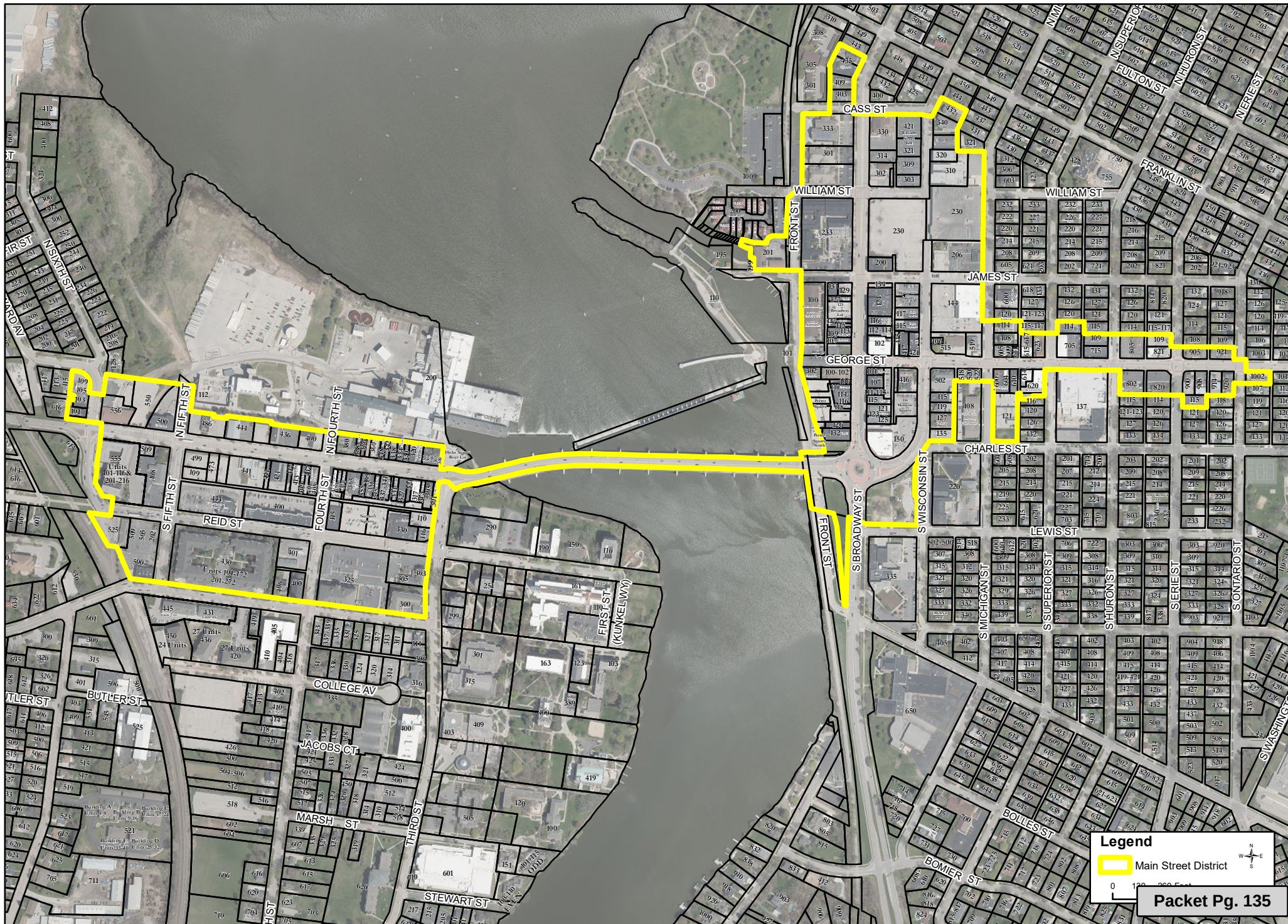
Consider converting portions of your business to digital platforms. Use e-commerce to promote digital payment methods, use delivery services, use booking and scheduling to stagger customer flow, offer discounts on shipping, etc.

7. **Maintain Facility Cleanliness.** Maintain facility cleanliness as prescribed by the CDC.
8. **Prepare for Social Distancing and Leverage Technology** by opting for video or phone conferencing instead of in-person meetings. Determine which employees are essential or non-essential for your business or organization to operate. Ask each business operations the following questions:
 - a. How can you accomplish critical tasks?
 - b. Do you have the technology and infrastructure needed to support employees working from home?
9. **Communicate Clear and Accurate Information and Stay Informed** by establishing a communication protocol to keep your workforce and customers informed.



City of De Pere Main Street District

1.12.c





2022 POST EVENT REPORT

BUSINESS
~~walk~~
talk

In Partnership With



building community through business

Business Walk Purpose

A business walk is an opportunity to chat with local businesses face-to-face to gather knowledge that will help foster a more prosperous business climate. The De Pere Business Walk was a one day visitation program to assess concerns that local businesses are facing. The information gathered is to be used to help prioritize economic development initiatives and guide business assistance.

2020 Business ~~Walk~~ Talk Highlights

The 2020 Business Walk was conducted virtually as a 'business talk' inviting businesses to take an online survey and having volunteers make phone calls to businesses that had agreed to participate. This 'talk' format resulted in interviews with 103 businesses, down 25% from the previous year. However, participating businesses provided valuable input regarding the state of the business climate in De Pere. Some interesting findings included:

- 62% of businesses implemented some form of operational changes in response to the pandemic.
- 81% of businesses that made operational changes anticipate that at least some of these changes will be sustained after the pandemic situation is resolved.
- 70% of businesses are experiencing negative revenues for 2020.
- 62% of businesses implemented some form of wage reduction program, including reduced hours, furloughs, temporary or permanent layoffs, or reduced/eliminated owner salaries.
- Retail, entertainment, hospitality and food service businesses experienced the most severe revenue impacts, with 100% of entertainment venues and more than half of retail, hospitality and restaurant businesses experiencing YTD declines of more than 50% in total revenues – in some cases up to 90% reductions were reported.
- Four percent of businesses experienced an increase in revenues for 2020, and 30% experienced no impact or have seen revenues return to normal after an initial decline.
- 70% of businesses were able to take advantage of at least one financial assistance program at the federal, state or local level. A majority of those that did not indicated a lack of need was the reason for not pursuing assistance.
- 29% of businesses are highly uncertain about the future, while 8 percent anticipating a lack of viability within 3 months and an additional 12 percent within 6 months if circumstances do not improve.
 - Businesses in danger of closure include 4 retailers, 4 personal service businesses, 2 entertainment venues, 2 restaurants, 2 professional service firms, 1 medical office and 1 non-profit
- The top three priorities for additional assistance to aid their business included direct financial assistance (primarily retail and personal service), financial assistance/wages to increase customer demand (professional services) and renewed access to customers (entertainment and hospitality).
- 85% of businesses identified at least one silver lining as a result of the pandemic, including a mix of business-related (improved operations, better customer/employee engagement) and personal (increased sense of togetherness, family time, exercise)

A more detailed overview of the business walk process and more specific insights gained through the walk are included in the following sections.

Key Take-Aways

Operational
Changes Will
Remain

Almost 30% of
businesses
uncertain about
the future

Financial
assistance is
top need

Business Walk Overview

Business talks took place over a four-day period from September 21-24th with additional time for online survey responses. Rather than dropping in on businesses within a specific geographic region, volunteers donated time to call businesses during time slots identified by the participating businesses. The 2020 business walk resulted in interviews of 103 businesses throughout the greater De Pere area, which represents just under 11 percent of businesses. Interviewed businesses included a mix of in the City of De Pere including retail, service, construction and manufacturing firms. The walk, in its fourth year, was conducted in partnership with the De Pere Area Chamber of Commerce, the City of De Pere, Definitely De Pere, and the Wisconsin Economic Development Corporation. The business talk is designed to take the pulse of the local business community, uncover opportunities and challenges for doing business in the De Pere area, and identify ways that local partners can help enhance and grow the local economy and create a business-friendly environment. This year, the talk focused on the economic impact of the COVID-19 pandemic on business operations and revenues and identify supports that could help businesses sustain and/or grow over the next year.

Interviews were completed by phone and online with respondents answering nine questions about their current business operations and needs. They also had the option of receiving a follow-up visit from a community partner to discuss specific opportunities or challenges identified by the visit, and could choose to receive a copy of the completed report.

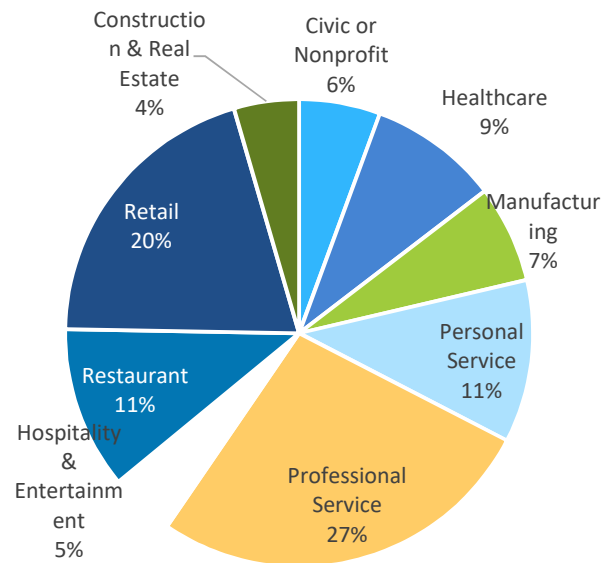
The results from the business visits, including both the quantitative survey results as well as additional comments and insights provided as part of the interviews are summarized in this document.

Business Respondents

Businesses responding to the survey represent a diverse mix of industries, as illustrated in the chart below. Service businesses (personal and professional) represented 38 percent of businesses interviewed, retail and restaurant accounted for another 31 percent, and the remaining businesses were engaged in manufacturing, warehousing, distribution, contracting and healthcare.

This year, more than in previous years, industry played a significant role in influencing responses, with shutdowns in certain industries and subsequent declines in consumer activity impacting entertainment, hospitality, food-service and retail businesses. It should also be noted that several civic or non-profit businesses anticipate that trickle-down effects will impact their operations next year.

Respondents by Industry



Survey Results

COVID-19 Impacts

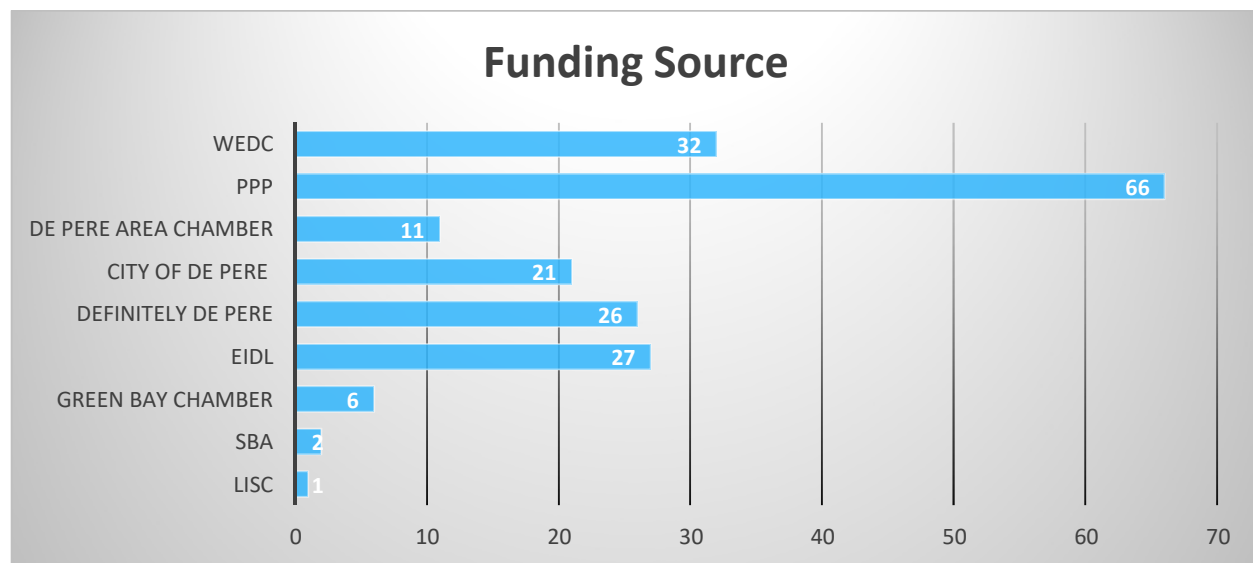
Nearly all businesses surveyed were impacted in some way by the pandemic, stay at home orders or shifting consumer behaviors. Only 8 percent of responding businesses reported no business operational adjustments during the pandemic. Three-quarters of businesses increased their online presence to reach customers, half of the businesses added remote work or adjusted business hours, and just over one-third added delivery or curbside offerings during 2020.

Businesses also were forced to make adjustments to the workforce. Sixty-two percent of businesses implemented some form of salary reduction, as indicated in the chart at right. These changes were driven largely by reduced revenues. While 26 percent of businesses indicated that they experienced no change in revenues or that revenues had returned to normal since closures in late spring, seventy percent of businesses experienced measurable declines in revenue for the year. These businesses are evenly split between businesses experiencing less than a 25 percent decrease, a decrease of 25-50 percent, or a decline of greater than 50 percent for the year. Four percent of businesses experienced an increase in sales for

Percent Implementing

2020, all of which are in the professional services or manufacturing sectors. Only six retail, entertainment, food or hospitality businesses were reflected in the pool of businesses that have seen sales rebound since the pandemic. Conversely, only one business experiencing revenue declines of greater than 50 percent was outside the retail, entertainment, hospitality or food services sectors.

A majority of businesses (69%) took advantage of at least one of the financial assistance programs offered at the federal, state, or local levels. Of those that did not utilize these assistances, the most common reason was lack of financial need (50%). Other businesses indicated a lack of eligibility or a desire to remain debt-free. Only three businesses indicated that they were not aware, or that they had applied but did not receive funds. The most frequently used program was PPP (85% of those receiving assistance), City/Chamber/Definitely De Pere funds (41%) and WEDC (38%). Only 4% utilized funds from the Green Bay Chamber. Of those that received assistance, businesses accessed an average of two sources of financial aid.



Future Plans

Many businesses anticipate that some operational shifts implemented during the pandemic will continue. For instance, 80 percent of businesses that increased online sales presence anticipate this change remaining permanent, 78% of those adding curbside or delivery services anticipate retention of these offerings, and half of respondents that implemented remote work or changed business hours plan to make all or part of these changes permanent.

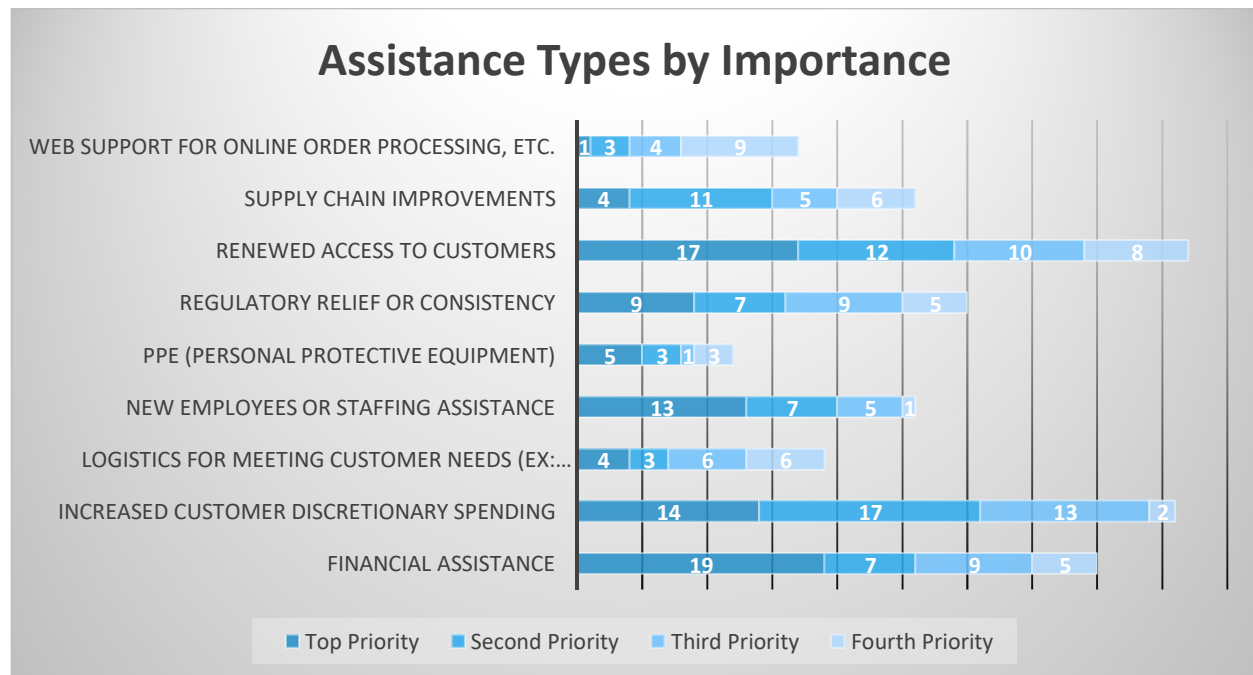
Businesses were also asked to describe their business outlook relative to current revenue trends. While 37 percent of businesses do not anticipate any operational concerns under current scenarios, 8 percent indicated a concern about viability beyond three months, 12 percent beyond 6 months, and 14 percent if circumstances do not change in the next 12-24 months. Just under one-third (29%) are highly uncertain about the future, with many indicating that future shutdowns, outbreaks or other changes could significantly impact future viability.

While significant uncertainty and concern over the future exists in the De Pere business community, it should also be noted that the vast majority of respondents (85%) identified at least one positive experience that came out of the pandemic period. The most frequently mentioned positives are listed below.

- ❖ Additional time with family - 32%
- ❖ Forced to improve business practices (online, organization, paperwork) - 21%
- ❖ Greater engagement with employees, customers, landlord, vendors – 20%
- ❖ More time for exercise, healthier lifestyle – 10%
- ❖ Support for local businesses more evident – 8%
- ❖ More empathy for others evident in community, stronger relationships
- ❖ Accomplished 'to do list', more free time

Assistance Desired

Respondents were asked to identify any specific types of assistance that would benefit their business. Businesses were allowed to identify up to four specific types of assistance that would be beneficial, in order of priority. The degree to which particular types of assistance would be beneficial is indicated in the chart below. Financial concerns remain the most critical element of recovery, with desire for direct financial assistance to businesses, financial assistance to customers to increase discretionary spending as two of the top three priorities. Renewed access to customers was also seen as critically important, although this likely means different things to different businesses.



By industry, hospitality and food service businesses also prioritized regulatory stability to plan ahead for operations. Professional service, medical and transportation firms continue to struggle to find employees to fill open positions, and while retail and personal services desired direct financial assistance, professional service firms preferred stimulus to increase customer demand.

Follow-up

The most important element of a business walk is the opportunity to follow-up with individual businesses regarding specific challenges, and to identify strategies or initiatives that will be undertaken as a result of the information learned during the survey. Of those surveyed, 11 percent requested that an individual follow-up with them to address their specific issues. A majority of respondents provided an email address to receive a copy of the results.

Business Walk Questionnaire

2020 Business Walk Questions:

De Pere Area Chamber - Business ~~Walk~~ Talk

(For all questions there will be an "Other" or "Comment" box for surveyors to fill in so they don't have to read all the answers. Then they can go back and check any that are applicable for compiling survey results. This should be explained in their training and in their script with suggested prompts.)

1. How has your business adjusted operations during the pandemic? *(check all that apply)*

- ☐ Remote work (past or currently going / will continue)
- ☐ Increasing online presence (past or currently going / will continue)
- ☐ Adding delivery or contactless/curbside pickup options (past or currently going / will continue)
- ☐ Changes in hours of operations (past or currently going / will continue)
- ☐ Other: _____

2. *How have you handled your payroll and/or workforce? *(check all that apply)*

- ☐ Temporary layoffs
- ☐ Temporary cuts in hours
- ☐ Permanent dislocation/separation
- ☐ Working without salary
- ☐ Furloughs
- ☐ No change
- ☐ Business has closed permanently
- ☐ Other: _____

Comments: _____

3. To what extent do you feel your revenue has been impacted since the original stay at home order? _____ %

Comments: _____

4. How long can your business weather the impact from COVID-19 given any recently implemented changes in operations? *(select one)*

- ☐ 0-3 Months
- ☐ 3-6 Months
- ☐ 1 Year
- ☐ 2 Years
- ☐ Unsure
- ☐ Not an issue

Comments: _____

5. *What are your most pressing needs? (Rank the top 4 from 1 to 4)

- ☐ Financial assistance (type: _____)
- ☐ Regulatory relief or consistency
- ☐ New employees or staffing assistance

- ☐ Renewed access to customers
- ☐ Increased customer discretionary spending
- ☐ Supply chain improvements
- ☐ PPE (personal protective equipment)
- ☐ Web support for online order processing, etc.
- ☐ Logistics for meeting customer needs (Ex: outdoor patios / drive up windows)

Comments: _____

6. Please select any financial assistance programs you were successful in receiving. (*select all that apply*)
If none, would you be willing to share why? (requirements, borrowing limitations or concerns, etc.)

- ☐ PPP - Paycheck Protection Program
- ☐ EIDL – Economic Injury Disaster Loan
- ☐ SBA Debt Relief
- ☐ SBA Express Bridge Loans
- ☐ IRS Employee Retention Credit
- ☐ Facebook Small Business Grants Program
- ☐ US Chamber Save Small Business Fund
- ☐ KIVA Microloans
- ☐ LISC Small Business Relief Grants
- ☐ WEDC – We’re All In Grant Program
- ☐ WEDC – Ethnic Minority Emergency Grant
- ☐ WWBIC – COVID-19 Fast Track Loan Program
- ☐ Verizon Small Business Recovery Fund
- ☐ Associated Bank COVID-19 Relief Program for Customers
- ☐ Bay Lake Regional Planning – Disaster Recovery Microloan Program
- ☐ City of De Pere – Small Business Pandemic Response Loan
- ☐ De Pere Area Chamber – Business Transition Grant
- ☐ Definitely De Pere – Business Relief Grant
- ☐ Greater Green Bay Chamber Back to Business Grant
- ☐ None (Indicate reason: _____)

Comments: _____

7. Have you had any positive experiences during the pandemic you’d like to share?
(Ex: more family time, improved employee relations, opportunity to be more active, eating healthier, sped up online adoption)

Comments: _____

8. Would you like someone to follow up with your company? Yes / No

(If yes: City / Chamber / Definitely De Pere)

(If yes: Contact information: _____)

9. We will email you a copy of this year’s Business *Talk* results. What email should we send it to?

Email: _____

Q8. Have you had any positive experiences during the pandemic you'd like to share?

(Ex: more family time, improved employee relations, opportunity to be more active, eating healthier, sped up online adoption)

- lots of cleaning and sanitizing time
- Greater vision with operations and keeping safety in the forefront. Understanding possible other ways to push and pull business toward us.
- Family time was great but the stress of the business was unbelievable.
- More family time, got that "to do" list done
- Got my sample room and catalogs cleaned out.
- Many new customers in the Retail, and animal feeds.
- More time to help out the community.
- A time to reset and re-evaluate everything. The opportunity to make changes in the business that were a long-time coming.
- We created Downtown Faces Forward as a way to promote small business and it created a great following and sense of positivity for our community--and for other downtowns.
- Funding sources approving Telehealth has been a very important change.
- more family time, spending time at home
- We were lucky enough to rent our biz' space from an awesome landlord who redid the heating and cooling while we were forced to be closed. A pro-active forward-thinking landlord is the best!
- work team coming together while facing uncertainty and obvious challenges
- Slowed things down for a bit which was nice to have a break from the day to day.
- More family time
- More family time has been great.
- Closer community of patients. We made it a goal in our office to do and act as normal. Be the place of normalcy in a world of chaos. We were very specific about never talking about COVID.
- Family Time
- Families have not been able to be with their loved ones during their most vulnerable and needed times nor for normal family visits. We have seen nothing positive in dealing with the elderly and family members of the elderly in the community. It is heartbreaking to listen to family's whose parents/grandparents/siblings have died alone because family is not allowed to be with them.
- Not really! lol.
- More family time, opportunity to grow as a team and adapt utilizing more technology
- Closer community of patients. We made it a goal in our office to do and act as normal. Be the place of normalcy in a world of chaos. We were very specific about never talking about COVID.
- More family time and more active.
- I guess the most positive thing, not that there's been much, was that our online performances allowed some of our out of town alumni to participate. That said, online comedy shows are tough.
- Our business has continued to be very steady
- Our members have really been very supportive, and we took the time we were closed to make improvements to the club.
- No. But we saw enough people wanting to help local business more than before by wanting to visit them but the rules made it harder.
- I have never worked in the same room with my husband prior to the pandemic. Now that we are both working from home, I have a clearer understanding of what he does and how hard he works everyday and I think he has the same with me.
- The fortitude of business owners and loyal customers has ruled

- Forced refinement of business operations.
- It has given me pause to know that anything can happen. People matter and a chance to show empathy
- My landlord was kind enough to cut rent by 50% in the first two months, as we all stayed at home. The increased family time with everyone home for dinner and indoors at night has been a wonderful return to my childhood patterns in the 1970's. I've had time to really focus on my health and feel better now than ever.
- Forced me to do things with my business that I wouldn't have done otherwise like online ordering and now I plan to keep it around because it's been working well.
- More family time some increase in productivity
- I was able to go for daily walks outside.
- Got to communicate how chiropractic helps the immune system.
- Sped up online adoption
- my life hasn't changed...maybe a little more family time. We were categorized as an essential business so we never shut down...just had some waves of slow down - we used that time in increase training and do some housekeeping. With all the "how to operate" changes our business was very busy just keeping up - seems the guidelines change with the day of the week. There is work in furloughs and bringing people back. We are fortunate that we brought everyone back to work. We are looking to hire - we are always looking to hire, especially techs and sales. It is interesting to hear about all the financial assistance programs - I had only heard of the one. I would like to know more about the others - maybe not so much me, but for my HR. For example the IRS one you mentioned, I would have thought that was the same as PPP. For my family there was also a lot of cancellations to manage with my kids - my daughter is very active in softball ball and her season was canceled so we worked hard to find alternative tournament solutions. Looking to the future, I see using less of our office space.
- Zoom meetings has freed up more time try to network and work with the non-for-profits that are aligned with the company.
- All attendees were very appreciative for being able to attend the fair and to show their animals. Even with the added stress of putting on the fair, the happiness and appreciation of the attendees made it a positive for all involved.
- NO Positives. The political climate has to change soon.
- Capitalized on the opportunity to work more together as a team to help each other and clients during difficult times. The creating of Downtown Faces Forwards social media campaign further business networking and low cost business marketing opportunity that might not have been utilized outside of COVID
- More family time
- More pool time
- more family time, the chance to really look at my business and make decisions for my ideal life
- More time with family, better work life balance, more "in office" time to complete workflow projects and internal efficiencies, implementation of new technology to better serve clients, more active, eating healthier
- Just keeping our head down and working.
- Every day presents new challenges. It is beginning to wear us down. Trying hard to stay positive.
- Clients appreciated the fact that we had a game plan in place prior and simply executed the plan to continue providing first rate service
- More family time and time to make improvements to our business.
- Family time, break from work.
- We have had some positive experiences throughout this pandemic. We've spent more time as a family and had more opportunities to get outside together. We also were able to make some improvements to our business during the months we were closed.
- Nothing has changed.
- Connected with people; eating healthier

- Changing our hours a bit gave me more time with family.
- Changing our hours a bit gave me more time with family.
- More customers purchasing our product than ever before.
- Checking more to-do list items off
- More quality time with family and physical activity
- Deeper connection with clients and employees
- More family time, healthier eating
- It slowed things down which is always nice to have a break but that lasted too long.
- We reduced our hours for a period, and I was able to spend more time at home with my family
- It has been nice to be relieved of the necessity to attend lots of events. I will start to miss them but it has been nice to simply go home at the end of my day.
- More family time
- able to eliminate underperforming employees
- hands down more family time and discovering the things you take for granted.
- More family time
- catch up on paperwork
- More pool time with the warm weather.
- More family time, customers wanting to support local
- more time at home, better online business practice
- Eating healthy and exercising more.
- loyalty of staff and customers
- Members and friends more likely to check on each other using other forms of communication
- More Family Time and an Increased Sense of Community
- our young boys being home together has built a very strong bond/friendship between them.
- We've learned that we could easily transition into remote work and it has had a huge positive impact on our employees who previously worked at the office.
- Streamlined operations
- Increased family time benefited our relationships
- More family time and time to exercise.
- The closure on Main Avenue has allowed us to make necessary renovations in order to return in a more economically viable position and prepared for any future inside service closures. Parking remains to be a potentially insurmountable obstacle for a quick service business.
- We have gotten very good at carryout
- more family time
- More family time
- Sorry; nothing positive has come from this, less stress on one hand, accompanied by more stress on the other, such as worrying about the future!
- Family time
- Other small businesses in De Pere bannin together to do small promotions, work together to try to cross promote, etc.
- Closer to employees
- I rode my bike on the trail and kayaked to relieve stress. Online store! still worked a lot.
- Downtown Faces Forward and informal support from other business and property owners.
- Closer family unit, stronger connection with patient base

- People taking care of other people - ie a customer picking up 15 bags of popcorn to drop door by door in a De Pere neighborhood
- I think the best thing, is being able to see how the community comes together. Our clients have expressed their concerns for our business and have strongly supported us. Local businesses also rally together to support each other. I have a greater appreciation for De Pere and very proud to have my business here!
- More family time
- We have gotten very good at carryout
- Closer to employees
- business as usual
- That's a tough one...other than knowing that you learn you need to work together to get thru something so impactful to all



City of De Pere, Wisconsin

Request For Common Council Action

MEETING DATE: November 17, 2020

DEPARTMENT: Plan Commission

FROM: Daniel Lindstrom

SUBJECT: Resolution #20-120 Granting Two Planning Options to Purchase to Howard Immel, Inc. (Venture Avenue and Profit Place).

ATTACHMENTS:

- Reso20-120 (PDF)
- Option to Purchase-Immel-Final-Venture Ave -11-11-20 (PDF)
- Exhibit A - Immel Venture Ave Option (PDF)
- Option to Purchase-Immel-Final -Profit Place 11-11-20(PDF)
- Exhibit A - Immel Profit Option (PDF)
- Immel Construction Options Memo 11102020 - Updated (PDF)

RESOLUTION #20-120

GRANTING TWO PLANNING OPTIONS TO PURCHASE TO HOWARD IMMEL, Inc.
(Venture Avenue and Profit Place)

WHEREAS, Howard Immel, Inc. has requested two (2) limited-term, 90-day Planning Options to Purchase City-owned properties of approximately 26 acres each, to conduct site due diligence for the purposes of securing a location for the potential construction of a manufacturing facility and office headquarters thereon; and

WHEREAS, the City wishes to promote such potential development, subject to the terms and conditions of the attached Planning Option to Purchase agreements attached hereto; and

WHEREAS, this matter has been reviewed by the Finance/Personnel Committee which recommends approval thereof.

NOW, THEREFORE, BE IT HEREBY RESOLVED THAT:

The Mayor and City Clerk are authorized and directed to enter into the Planning Option to Purchase (Venture Avenue) between the City of De Pere and Howard Immel, Inc., as is attached hereto as Exhibit 1, subject to such changes as deemed necessary by the City Attorney.

BE IT FURTHER RESOLVED THAT:

The Mayor and City Clerk are authorized and directed to enter into the Planning Option to Purchase (Profit Place) between the City of De Pere and Howard Immel, Inc., as is attached hereto as Exhibit 2, subject to such changes as deemed necessary by the City Attorney.

BE IT FURTHER RESOLVED THAT:

All City officials, officers, and employees are further authorized and directed to take such steps as are lawful and necessary in furtherance thereof.

Resolution #20-120

Page 2 of 2

Adopted by the Common Council of the City of De Pere, Wisconsin, this 17th day of November, 2020.

APPROVED:

James G. Boyd, Mayor

ATTEST:

Carey E. Danen, City Clerk

Ayes: _____

Nays: _____

Committee Approval: 11/10/2020

PLANNING OPTION TO PURCHASE
(Venture Avenue)

This Planning Option to Purchase property adjacent to Venture Avenue (“Venture Avenue Planning Option” or “Option”) is entered into this ____ day of _____, by and between the City of De Pere, a Wisconsin municipal corporation (“City”) and Howard Immel, Inc., a Wisconsin Corporation (“Developer”).

RECITALS

WHEREAS, City is the owner of Parcel WD-D0077 in the City of De Pere (the “Property”), shown on Exhibit A, attached hereto and incorporated herein, legally described as:

Lot 2 of 61 Certified Survey Maps Page 349, Map Number 8697, Document Number 2753579, being a part of Outlot 1, De Pere Business Park South Addition located in part of the Northeast ¼ of the Southwest ¼; part of Government Lot 1, part of the Northwest ¼ of the Southeast ¼, part of the Southwest ¼ of the Southeast ¼, Section 32, Trans 23 North, Range 20 East, City of De Pere, Brown County, Wisconsin (approximately 26.63 acres)

and located in Tax Incremental Financing District No. 11 (TID #11) for the City of De Pere; and

WHEREAS, Developer has inquired as to the feasibility of industrial development of the Property and requested an Option to allow time to complete due diligence tasks associated with such potential development; and

WHEREAS, City is interested in seeing the Property developed as an industrial facility and wishes to grant this Option to Developer as a means leading to a possible, eventual sale and development of the Property; and

WHEREAS, City and Developer are willing to negotiate the sale and purchase of the Property upon the determination that the potential development is feasible.

NOW, THEREFORE, for good and valuable consideration, of which receipt is acknowledged, the Parties agree as follows:

- 1) The Recitals set forth above are an integral part of this Agreement and are therefore incorporated herein by reference as if set forth herein as agreements of the parties.
- 2) City hereby grants to Developer an exclusive Option for an initial term expiring ninety (90) days from the date set forth above (the “Initial Term”) to perform due diligence tasks and engage in the process of negotiating the purchase of the Property. As consideration for the City’s grant of the Initial Term, Developer shall have prepared a wetland delineation study (approximate value \$3,250) of the Property and provide a copy of the same to City.

- 3) Developer may extend the Option for an additional ninety (90) day period (the “1st Extended Term”) by paying City \$3,250 for the extension prior to the expiration of the Initial Term. The 1st Extended Term may be extended up to an additional ninety (90) days (the “2nd Extended Term”) upon written consent of the Parties provided Developer has paid City an additional \$3,250 for the extension prior to the expiration of the 1st Extended Term.
- 4) City, during the Initial Term or any Extended Term, shall not convey, sell, lease or transfer any indicia of ownership to any other legal entity and hereby grants to Developer exclusive rights to negotiate the purchase of the Property unless Developer notifies City in writing that it is terminating the Option and will not purchase the Property.
- 5) In the event Developer determines the potential development is not feasible during the term of this Option, Developer shall notify the City in writing of its determination and this Option shall immediately terminate.
- 6) The Parties acknowledge that City has granted Developer a similar Planning Option to Purchase property adjacent to Profit Place in the City of De Pere (“the Profit Place Option”). If Developer exercises the Profit Place Option to Purchase, this Planning Option to Purchase shall terminate.
- 7) If Developer determines to exercise this Option and purchase the Property, it shall notify City in writing prior to termination of the Initial Term or any Extended Term. If Developer exercises this Option within the Initial Term, all Option fees paid for this Initial Option and the Initial Profit Place Option shall be credited toward the final purchase price for the Property.
- 8) During the Initial Term or any Extended Term, and upon determining the potential development is feasible, the Parties shall work together and negotiate proposed Property sale and development terms, which shall be presented to the City’s Finance/Personnel Committee for review, with final approval of a negotiated Property Sale/Development Agreement by the City’s Common Council.
- 9) If the Parties agree upon and execute a Property Sale/Development Agreement, the City shall convey the Property to Developer in accordance with the terms and conditions of said Agreement.
- 10) City and Developer shall pay all of their own legal fees as well as any third-party fees related to this Option.
- 11) Any notice required or permitted hereunder shall be sent by first class mail, postage prepaid, return receipt requested, to the parties at the following addresses:

Venture Avenue Option
Howard Immel, Inc.
Page 2 of 4

To City: City of De Pere
335 S. Broadway Street
De Pere, WI 54115
Attn: City Administrator

To Developer: Howard Immel, Inc.
1820 Radisson Street
Green Bay, WI 54302
Attn: Carol Karls

or at such other address as the respective parties may from time to time give written notice thereof. Notice shall be effective when received, refused or returned by the Postal Service as undeliverable.

- 12) This Option may be assigned only upon written consent thereto by the other Party.
- 13) This Option may be amended only by written amendment thereto executed by the Parties or, if assigned hereunder, that Part's successor in interest.
- 14) If any provision, covenant, agreement or portion of this Agreement or its application to any person, entity or property is held invalid, such invalidity shall not affect the application or validity of any other provision, covenant or portion of this Agreement, and to that end, all provisions, covenants, agreements and portions of this Agreement are declared to be severable.
- 15) Either Party may record this Agreement with the Register of Deeds for Brown County.
- 16) This Agreement may be executed in counterpart, each of which shall be deemed to be an original, but all of which together shall constitute one and the same instrument.

AGREEMENT CONTINUES ON FOLLOWING PAGE

IN WITNESS WHEREOF, the parties hereto have caused this agreement to be duly executed on their behalf, as of the _____ day of _____, 2020.

HOWARD IMMEL, INC.

By: _____

Print Name: _____

Print Name: _____

STATE OF WISCONSIN)
)SS.
BROWN COUNTY)

Personally came before me this ____ day of _____, 2020, the above named _____ and _____, known as the person(s) who executed the foregoing instrument and acknowledged the same.

Notary Public, State of Wisconsin
My Commission Expires: _____.

Drafted by: Judith Schmidt-Lehman

J:\Law\Agreements\2020\Option to Purchase\Option to Purchase-Immel-Venture-Final

CITY OF DE PERE

By: _____

James G. Boyd, Mayor

Carey E. Danen, City Clerk

STATE OF WISCONSIN)
)SS.
BROWN COUNTY)

Personally came before me this ____ day of _____, 2020, the above named James G. Boyd and Carey E. Danen, known as the persons who executed the foregoing instrument and acknowledged the same.

Notary Public, State of Wisconsin
My Commission Expires: _____.

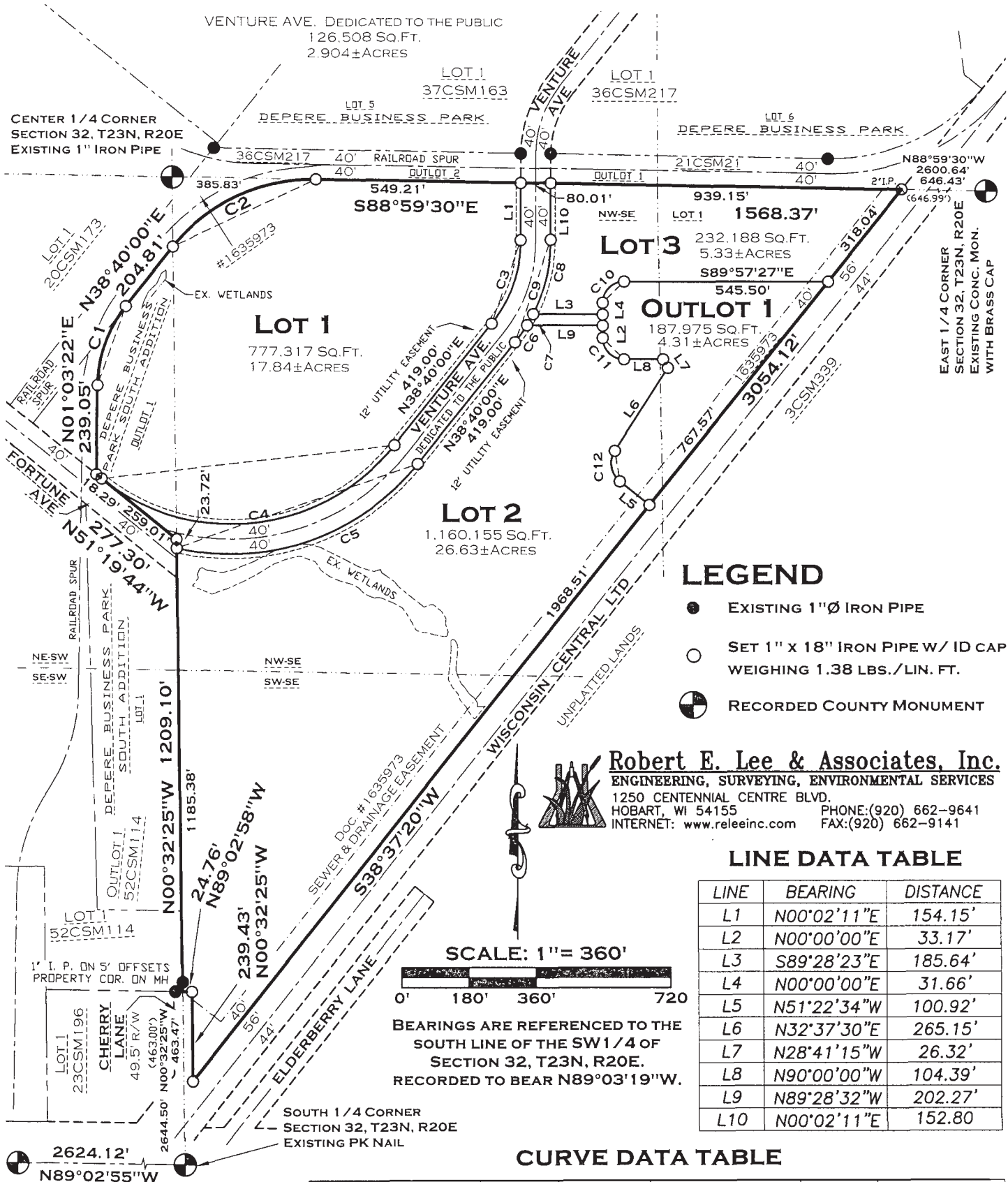
THIS IS AN UNOFFICIAL COPY
OF A DOCUMENT RECORDED
IN THE REGISTER OF DEEDS
OFFICE.

2753579

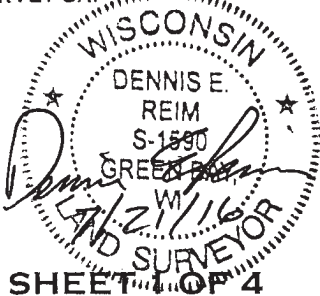
8697

CERTIFIED SURVEY MAP

PART OF OUTLOT 1, DE PERE BUSINESS PARK SOUTH ADDITION LOCATED IN PART OF THE NORTHEAST 1/4 OF THE SOUTHWEST 1/4; PART OF GOVERNMENT LOT 1, PART OF THE NORTHWEST 1/4 OF THE SOUTHEAST 1/4, PART OF THE SOUTHWEST 1/4 OF THE SOUTHEAST 1/4, SECTION 32, T23N, R20E, CITY OF DE PERE, BROWN COUNTY, WISCONSIN.



CURVE	DELTA	ARC	RADIUS	CHORD BEARING	CHORD	TAN BEARING
C1	37°36'38"	229.75'	350.00'	N19°51'41"E	225.65'	
C2	52°20'30"	439.46'	481.06'	N64°50'15"E	424.34'	
C3	38°37'49"	242.72'	360.00'	N19°21'05"E	238.15'	
C4	90°00'16"	879.69'	560.00'	S83°40'08"W	791.99'	
C5	64°39'20"	722.21'	640.00'	S70°59'40"W	684.50'	N76°40'40"W
C6	07°19'20"	56.23'	440.00'	S35°00'20"W	56.19'	
C7	04°27'01"	34.18'	440.00'	S29°07'09"W	34.17'	
C8	26°51'28"	206.25'	440.00'	S13°27'55"W	204.37'	
C9	38°37'49"	296.66'	440.00'	N19°21'05"E	291.07'	
C10	90°02'33"	89.58'	57.00'	N45°01'16"E	80.64'	
C11	90°00'00"	89.54'	57.00'	N45°00'00"W	80.61'	
C12	84°00'04"	90.90'	62.00'	N09°22'32"W	82.97'	



SHEET 1 OF 4

FILE: R:\0404415csm.dwg

PLANNING OPTION TO PURCHASE
(Profit Place)

This Planning Option to Purchase property adjacent to Profit Place (“Profit Place Planning Option” or “Option”) is entered into this ____ day of _____, by and between the City of De Pere, a Wisconsin municipal corporation (“City”) and Howard Immel, Inc., a Wisconsin Corporation (“Developer”).

RECITALS

WHEREAS, City is the owner of Property located adjacent to Profit Place in Tax Incremental Financing District No. 10 (TID #10), including an approximate 26.63 acre parcel, shown on Exhibit A attached hereto, for which Developer is interested in obtaining a Planning Option to Purchase (the “Property”); and

WHEREAS, Developer has inquired as to the feasibility of industrial development of the Property and requested an Option to allow time to complete due diligence tasks associated with such potential development; and

WHEREAS, City is interested in seeing the Property developed as an industrial facility and wishes to grant this Option to Developer as a means leading to a possible, eventual sale and development of the Property; and

WHEREAS, City and Developer are willing to negotiate the sale and purchase of the Property upon the determination that the potential development is feasible.

NOW, THEREFORE, for good and valuable consideration, of which receipt is acknowledged, the Parties agree as follows:

- 1) The Recitals set forth above are an integral part of this Agreement and are therefore incorporated herein by reference as if set forth herein as agreements of the parties.
- 2) City hereby grants to Developer an exclusive Option for an initial term expiring ninety (90) days from the date set forth above (the “Initial Term”) to perform due diligence tasks and engage in the process of negotiating the purchase the Property. As consideration for the City’s grant of the Initial Term, Developer shall pay City the sum of three-thousand two hundred fifty dollars (\$3,250).
- 3) Developer may extend the Option for an additional ninety (90) day period (the “1st Extended Term”) by paying City \$3,250 for the extension prior to the expiration of the Initial Term. The 1st Extended Term may be extended up to an additional ninety (90) days (the “2nd Extended Term”) upon written consent of the Parties provided Developer has paid City an additional \$3,325 for the extension prior to the expiration of the 1st Extended Term.
- 4) City, during the Initial Term or any Extended Term, shall not convey, sell, lease or transfer any indicia of ownership to any other legal entity and hereby grants to

Developer exclusive rights to negotiate the purchase of the Property unless Developer notifies City in writing that it is terminating the Option and will not purchase the Property.

- 5) In the event Developer determines the potential development is not feasible during the term of this Option, Developer shall notify the City in writing of its determination and this Option shall immediately terminate.
- 6) The Parties acknowledge that City has granted Developer a similar Planning Option to Purchase property adjacent to Venture Avenue in the City of De Pere ("the Venture Avenue Option"). If Developer exercises the Venture Avenue Option, this Profit Place Planning Option shall terminate.
- 7) If Developer determines to exercise this Option and purchase the Property, it shall notify City in writing prior to termination of the Initial Term or any Extended Term. If Developer exercises this Option within the Initial Term, all Option fees paid for this Initial Option and the Initial Venture Avenue Option shall be credited toward the final purchase price for the Property.
- 8) During the Initial Term or any Extended Term, and upon determining the potential development is feasible, the Parties shall work together and negotiate proposed Property sale and development terms, which shall be presented to the City's Finance/Personnel Committee for review, with final approval of a negotiated Property Sale/Development Agreement by the City's Common Council.
- 9) If the Parties agree upon and execute a Property Sale/Development Agreement, the City shall convey the Property to Developer in accordance with the terms and conditions of said Agreement.
- 10) City and Developer shall pay all of their own legal fees as well as any third-party fees related to this Option.
- 11) Any notice required or permitted hereunder shall be sent by first class mail, postage prepaid, and return receipt requested, to the parties at the following addresses:

To City:

City of De Pere
335 S. Broadway Street
De Pere, WI 54115
Attn: City Administrator

To Developer:

Howard Immel, Inc.
1820 Radisson Street
Green Bay, WI 54302
Attn: Carol Karls

or at such other address as the respective parties may from time to time give written notice thereof. Notice shall be effective when received, refused or returned by the Postal Service as undeliverable.

- 12) This Option may be assigned only upon written consent thereto by the Parties.
- 13) This Option may be amended only by written amendment thereto executed by the Parties or, if assigned hereunder, that Party's successor in interest.
- 14) If any provision, covenant, agreement or portion of this Agreement or its application to any person, entity or property is held invalid, such invalidity shall not affect the application or validity of any other provision, covenant or portion of this Agreement, and to that end, all provisions, covenants, agreements and portions of this Agreement are declared to be severable.
- 15) Either Party may record this Agreement with the Register of Deeds for Brown County.
- 16) This Agreement may be executed in counterpart, each of which shall be deemed to be an original, but all of which together shall constitute one and the same instrument.

AGREEMENT CONTINUES ON FOLLOWING PAGE

IN WITNESS WHEREOF, the parties hereto have caused this agreement to be duly executed on their behalf, as of the _____ day of _____, 2020.

HOWARD IMMEL, INC.

By: _____

Print Name:

Print Name:

STATE OF WISCONSIN)
)SS.
BROWN COUNTY)

Personally came before me this ____ day of _____, 2020, the above named _____ and _____, known as the person(s) who executed the foregoing instrument and acknowledged the same.

Notary Public, State of Wisconsin
My Commission Expires: _____.

Drafted by: Judith Schmidt-Lehman

J:\Law\Agreements\2020\Option to Purchase\Option to Purchase-Immel-Venture-Final

CITY OF DE PERE

By: _____

James G. Boyd, Mayor

Carey E. Danen, City Clerk

STATE OF WISCONSIN)
)SS.
BROWN COUNTY)

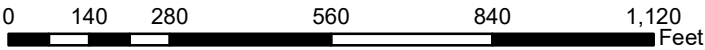
Personally came before me this ____ day of _____, 2020, the above named James G. Boyd and Carey E. Danen, known as the persons who executed the foregoing instrument and acknowledged the same.

Notary Public, State of Wisconsin
My Commission Expires: _____.



East Park Conceptual Parcel Sale Map

City of De Pere



This map was produced utilizing a variety of sources the City of De Pere reasonably believes are reliable, including GIS data, some of which was under development at the time this map was produced. The City of De Pere makes no warranty, either expressed or implied, including no warranty as to fitness for a particular use, of the information contained in or comprising, this map.

File Path:

Exhibit A

Packet Pg. 162

Data Source

CITY OF DE PERE MEMO



To: Mayor James Boyd
Larry Delo, City Administrator

From: Daniel Lindstrom, Development Services Director

Date: November 10, 2020

RE: **Immel Construction – West and East Park Parcel Short Term Options.**

Immel Construction (Developer) approached the City of De Pere with a development interest for a manufactory looking for approximately 24-26 Acres of industrial lands for a 300,000 to 350,000 square foot manufacturing and headquarters office facility. The business would like to move quickly and be able to break ground in 2021; therefore, the Developer is spending a significant amount of time conducting initial site due diligence. The City presented the Developer with two potential sites: (1) Parcel WD-D0077 In the west business park or (2) a combination/reconfiguration of parcels in the east park. See the sites below.

West Park (WD-D0077)



East Park



Option Request:

The Developer requests two “short” or “limited” term options to continue their site due diligence. They have requested 90-day options for the two parcels. This is different from our typical process but staff believes we can prepare a planning option to meet their needs and still allow for a more detailed option or agreement if the business was to select one of the sites.

West Business Park - WD-D0077 Terms:

- Located in TID No. 11.
- City to present the Developer with a 90 Day PLANNING Option to conduct due diligence.
- The Developer may extend additional 90 days for \$3,250 (26 Acres at \$500/acre = 13,000 per year. 90 days for \$3,250.
- The City to grant an ROP to the Developer to prepare a wetland delineation and share it with the City.

- If Developer exercises the Profit Place Planning Option to Purchase, the Fortune Avenue Planning Option to Purchase shall terminate.
- The City, during the Initial Term or any Extended Term, shall not convey, sell, lease or transfer any indicia of ownership to any other legal entity and hereby grants to Developer exclusive rights to negotiate the purchase of the Property unless Developer notifies City in writing that it is terminating the Option and will not purchase the Property.
- During the Initial Term or any Extended Term, and upon determining the potential development is feasible, the Parties shall work together and negotiate proposed Property sale and development terms, which shall be presented to the City's Finance/Personnel Committee for review, with final approval of a negotiated Property Sale/Development Agreement by the City's Common Council.

East Business Park – Profit Place Terms:

- Located in TID No. 10.
- City to present the Developer with a 90 Day PLANNING Option to conduct due diligence at a cost of \$3,250. (26 Acres at \$500/acre = 13,000 per year. 90 days for \$3,250.
- The Developer may extend additional 90 days for \$3,250. (26 Acres at \$500/acre = 13,000 per year. 90 days for \$3,250.
- The City to share the recent wetland delineation findings and subsequent DNR actions.
- If Developer exercises the Fortune Avenue Planning Option to Purchase, the Profit Place Avenue Planning Option to Purchase shall terminate.
- The City, during the Initial Term or any Extended Term, shall not convey, sell, lease or transfer any indicia of ownership to any other legal entity and hereby grants to Developer exclusive rights to negotiate the purchase of the Property unless Developer notifies City in writing that it is terminating the Option and will not purchase the Property.
- During the Initial Term or any Extended Term, and upon determining the potential development is feasible, the Parties shall work together and negotiate proposed Property sale and development terms, which shall be presented to the City's Finance/Personnel Committee for review, with final approval of a negotiated Property Sale/Development Agreement by the City's Common Council.

Staff recommends the approval of the short-term planning options for potential development. If recommended for approval staff would prepare separate planning options for each development site.



City of De Pere, Wisconsin

Request For Common Council Action

MEETING DATE: November 17, 2020

DEPARTMENT: Plan Commission

FROM: Peter Schleinz

SUBJECT: Resolution #20-121 Regarding the Vacation of a Public Thoroughfare (500 Block of Charles Street; adjacent to Parcels ED-914 and ED-920) - Refer to Public Hearing.

On March 23, 2020 Plan Commission unanimously recommended approval by a vote of 7-0.

The original discontinuance review by Plan Commission in March included both Wisconsin ST and Charles ST. Due to timing with changes in the conditions, Common Council is reviewing the discontinuance of the two streets separately.

ATTACHMENTS:

- Mayor-CC-500 BLK Charles Street (PDF)
- Reso20-121 (PDF)
- Exhibit A-Charles Street Vacation (PDF)
- ROW Vacation - S Wisconsin ST & Charles ST - Plan Commission Report (PDF)
- Application Form - NOT PAID YET (PDF)
- Discontinuance Exhibit - Charles ST - L-11241 (PDF)

CITY OF DE PERE

MEMO

To: James G. Boyd, Mayor
Members of the Common Council

From: Judith Schmidt-Lehman, City Attorney

RE: Resolution #20-121
Vacating a Portion of a Public Thoroughfare (West portion of the 500 Block of Charles Street; Adjacent to Parcels ED-914 and ED-920)

Date: November 17, 2020 (meeting date)

The statutory process for the City to initiate a public way vacation is a bit out of the ordinary. Since the City Council does not vacate a public way often, I thought I would send along this memo to explain the process.

Under Wis. Stats. §66.1003, the City may initiate vacating a public way. This is done by the Council introducing the vacation resolution at a Council meeting. The matter is then set for public hearing, with the same resolution coming back before the Council for action at that public hearing.

Therefore, the action to be taken at the November 17, 2020 meeting as to the above Resolution is merely to refer the Resolution forward for a public hearing. It will then be placed on the Council agenda at the time of public hearing, at which time the merits of the vacation can be debated and acted upon.

If you have any questions regarding this process, please let me know.

JSL

J:\Law\Memos\2020\Mayor-CC 500 BLK Charles Street Vacation11-12-20.docx

RESOLUTION #20-121

REGARDING THE VACATION OF A PUBLIC THOROUGHFARE
(West portion of the 500 Block of Charles Street; Adjacent to Parcels ED-914 and ED-920)

WHEREAS, the Common Council of the City of De Pere has initiated the vacation and discontinuance of a public thoroughfare in accordance with the requirements of Wis. Stats. §66.1003(4)(a); and

WHEREAS, the public interest may require the vacation of such rights-of-way; and

WHEREAS, the Plan Commission has reviewed and recommended approval of such vacation and discontinuance, with a public hearing on said vacation to be held in accordance with Wis. Stats. §66.1003(4)(b), on _____, 202__ at 7:35 p.m.

NOW, THEREFORE, BE IT HEREBY RESOLVED THAT:

Section 1. West portion of the 500 Block of Charles Street located west from the alley and the Charles Street/South Michigan Street intersection, East Side of Fox River, City of De Pere, Brown County, Wisconsin more fully described as:

Part of Charles Street being located in part of Private Claims 32 and 33, East Side of the Fox River, City of DePere, Brown County, Wisconsin, more fully described as follows: Beginning at the Northeast Corner of Lot 12, Block 27 of the "Original Plat of De Pere" Volume 1, Plats, Page 23, Document number 17, Brown County Records; thence N89°21'02"W, 159.73 feet along the North line of said Lot 12 and its extension; thence 65.58 feet along the West right of way of Charles Street being the arc of a 304.50 foot radius curve to the left whose long chord bears N24°13'54"E, 65.46 feet; thence S89°21'02"E, 133.55 feet along the North right of way of Charles Street; thence S0°38'58"W, 60.00 feet to the point of beginning.

Road Vacation area contains 8,720 square feet / 0.20 acres more or less.

be and the same is hereby wholly vacated and discontinued as a public thoroughfare. All

Resolution #20-121

Page 2 of 2

utility easements are retained. Said public right-of-way to be vacated is shown on the scale map attached hereto and incorporated by reference herein as Exhibit A.

Section 2. The City Clerk-Treasurer is hereby authorized and directed to file and record this resolution, with the legal description and map attached, in the Office of the Register of Deeds for Brown County and to amend the Official Map of the City in conformity with this Resolution.

Introduced to the Common Council of the City of De Pere at its regular meeting held on the 17th day of November, 2020.

Adopted by the Common Council of the City of De Pere, Wisconsin, this _____ day of _____, 20____.

APPROVED:

James G. Boyd, Mayor

ATTEST:

Carey E. Danen, City Clerk

Ayes: _____

Nays: _____

Plan Commission Approval: 3/23/2020



Road Vacation Exhibit

Part of Charles Street being located in part of Private Claims 32 and 33, East Side of the Fox River,
City of DePere, Brown County, Wisconsin



North



Bearings referenced to the
West line of S Wisconsin
Street, assumed to be
N0°38'17"E

width varies

Lot 1
54 CSM 312

width varies

S Wisconsin Street

S Wisconsin Street

Brown County ID
Point #30R14.1
Iron Rod W/Cap

Brown County ID
Point #30R16.3
PK Nail

Scale: 1" = 80'

Client: City of De Pere

Tax Parcel:
Drafted By: MRA
File: P-7516Road Vacation 071216.dwg

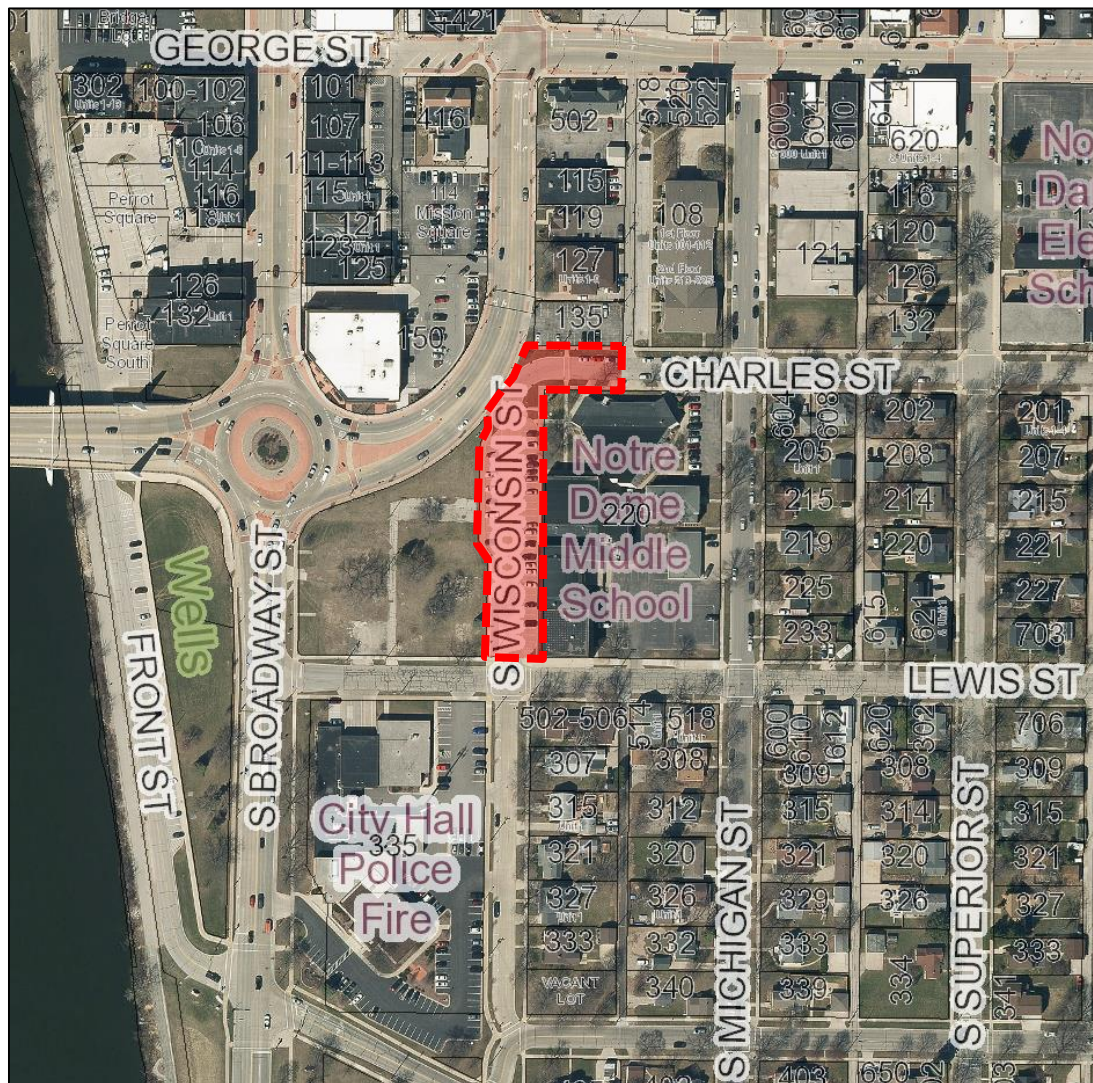
Mau & Associates
LAND SURVEYING & PLANNING
CIVIL & WATER RESOURCE ENGINEERING
Phone: 920-434-9670 Fax: 920-434-9672

Sheet One of Two
Project No.: P-7516
Drawing No.: L-11241

- ITEM 10: Staff recommendation and possible action regarding a proposed right-of-way vacation/discontinuance for the 200 BLK of S Wisconsin ST and the west portion of the 500 BLK Charles ST (Adjacent to Parcels ED-812, ED-914, ED-920).

*

PROPOSED RIGHT-OF-WAY VACATION/DISCONTINUANCE



REQUESTED ACTION: Public Right-Of-Way Vacation/Discontinuance Approval.

Right-Of-Way Vacation/Discontinuance for two unnecessary street segments should the Mulva Cultural Center be developed.

COMMON DESCRIPTION: The 200 BLK of S Wisconsin ST and part of the 500 BLK of Charles ST, located north from the Wisconsin ST/Lewis ST intersection and west from the alley and the Charles ST/S Michigan ST intersection.

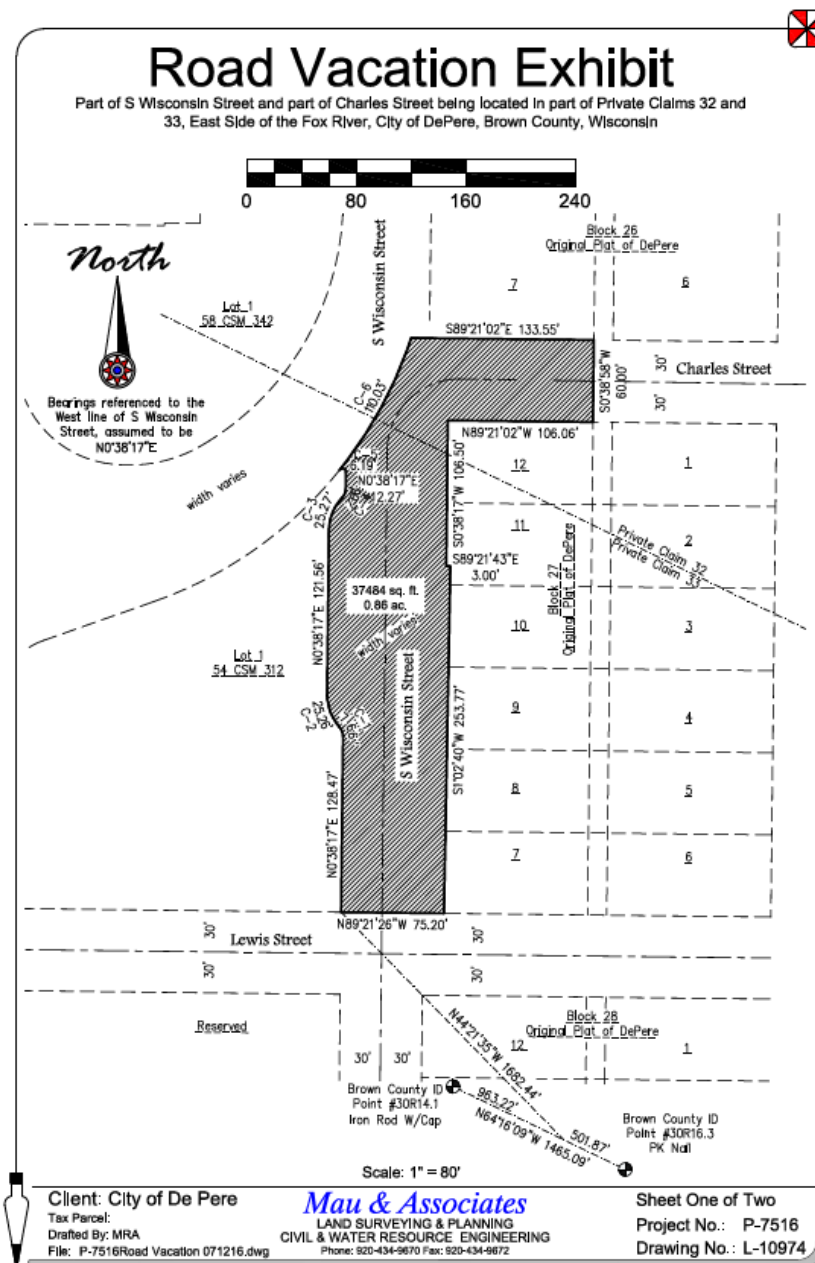
PARCEL NUMBER(S):	Adjacent to Parcels ED-812, ED-914, ED-920	
EXISTING ZONING:	None as the area is existing Right-Of-Way.	
PROPOSED ZONING:	If the vacation is approved by Common Council, and a proposed rezoning for the subject parcels occurs in the near future the vacated right-of-way will take on an R-4 zoning with a PDD overlay.	
SURROUNDING LAND USES:	Uses surrounding the proposed development, not the right-of-way: North (across Wisconsin & Charles) B-1, R-3, R-4 – business, multi-family South (across Lewis) R-2 – Government, single & two-family East (across Michigan) R-2 – single & two-family West (Across Broadway) B-1 – parkland & Fox River	
COMPREHENSIVE PLAN:	Commercial & Institutional/Governmental Facilities	
APPLICANT/OWNER NAME:	Rick Bilotto Authorized Representative De Pere Cultural Foundation INC 231 S Adams ST Green Bay, WI 54301	City of De Pere Public Right-of-way Owner 335 S Broadway ST De Pere, WI 54115
SITE HISTORY:	The proposed site includes parts of two City streets, created from the “Original Plat of De Pere,” that have been in existence since air photos of 1938. The City block to the west of S Wisconsin ST is vacant, and the block to the east has a church, middle school, and parking lot. In the first week of May 2019, the Mulva family announced plans to build an approximate \$50 million cultural center on the site called the “Mulva Cultural Center.” One week later, plans were announced to remove the middle school and the nearby Notre Dame Elementary School, and build a new \$27 million middle/elementary school on the existing elementary school property. Construction of the new off-site school is in progress. In November 2019, St. Francis Xavier Church proposed a land division and site plan for Parcel ED-920 that included the removal of buildings, retaining and expanding the church building, and separating the parking lot. The purpose of the separation of the parking lot was to create a shared parking area with the future cultural center. On January 27, 2020, the De Pere Redevelopment Authority initiated the drafting of agreements to transfer ownership of Parcel ED-812 to the De Pere Cultural Foundation INC for the construction of the Mulva Cultural Center. In February and March 2020, the Mulva Cultural Center Foundation initiated a rezoning and a right-of-way vacation/discontinuance of lands to prepare the area for the Mulva Cultural Center building. This report reflects the vacation/discontinuance only; the rezoning and plan	

development creation will be reviewed by Plan Commission in the coming months.

STAFF REVIEW:

When reviewing a right-of-way vacation/discontinuance, staff utilizes the vacation process identified in Wisconsin State Statutes 66.103 and 66.105. The role of the Plan Commission in the process is to determine if such a vacation/discontinuance is necessary and if so, recommend to the Common Council that the right-of-way be vacated/discontinued. The following are factors for consideration:

- The right-of-way area is adjacent to three parcels of land. The primary use for the streets is access and parking for a middle school that is proposed to be demolished upon the completion of the new school and for parking for a nearby church. Parking accommodations for the church are proposed to be accommodated with a new Church/cultural center.
- The adjacent parcels are proposed for the redevelopment of the vacant sites into the Mulva Cultural Center. The east side of the proposed new building, and parking area, would land within the right-of-way if the right-of-way is not vacated/discontinued.
- The vacation/discontinuance has been reviewed by Development Services and Engineering staff. Conditions of approval were reviewed by Legal staff. If the right-of-way is vacated, the proposed conditions should apply.
 - Create/retain a utility easement for all of Charles Street, but the utilities and easement can be removed for Wisconsin Street.
 - Create an 8-foot snow storage easement at the east end of the vacating Charles Street at the alley.
 - Create a 20-foot walkway easement over the sidewalk on the north side.
 - Relocate the Charles Street sanitary sewer and storm sewer lateral to St Francis Xavier Church. If this property is not going back to St Francis Xavier, they will need rights for their laterals in these areas.
 - If the right-of-way is vacated/discontinued the land should legally be attached to Parcels ED-812, ED-914 and ED-920.



Typically, when a right-of-way is vacated/discontinued, the land is divided in half and attached to each adjacent property owner. However; when all of the land was originally dedicated by an owner on one side of the right-of-way to create the street, all of the rights-of-way then is attached back to the original land that dedicated the right-of-way. Brown County Property Listing has indicated that S Wisconsin ST and Charles ST likely will be divided in half, with all of the parking area of the right-of-way on S Wisconsin ST going to the west.

All immediately adjacent property owners have been notified of the right-of-way vacation/discontinuance petition. No comments have been received as of March 17, 2020.

If an adjacent property owner did object to a proposed vacation, then the need for a simple majority vote of approval from the Common Council changes to the need for a 2/3 vote (6 out of 8 Council members must vote in favor, not just 2/3 of Council members in attendance when voting).

Any property owner comments received after March 17, 2020, will be provided to the Plan Commission at the meeting on March 23, 2020.

REVIEW PROCESS:

The Common Council will review the Plan Commission recommendation twice, first as a resolution on April 8, 2020 and then with a public hearing and resolution potentially on May 19, 2020.

Immediately adjacent property owners were notified of all proposed meetings. The review process follows State Statute requirements and there is not a 300-foot nearby neighbor notification requirement.

STAFF RECOMMENDATION:

Staff recommends APPROVAL and forwarding the right-of-way vacation to the Common Council for final approval with the following conditions:

1. Create/retain A utility easement over all of Charles Street from the alley to Wisconsin Street. No permanent structures will be allowed in this area.
2. Any utilities within Wisconsin Street are properly relocated to allow easements within the right-of-way to be released.
3. Create an 8-foot snow storage easement at the east end of the vacating Charles Street at the alley.
4. Create a 20-foot walkway easement over the sidewalk on the north side.
5. Relocate the Charles Street sanitary sewer and storm sewer lateral to St Francis Xavier Church. If this property is not going back to St Francis Xavier, they will need rights for their laterals in these areas.

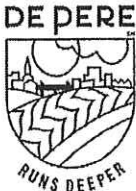
LEGAL DESCRIPTION

Part of S Wisconsin Street and part of Charles Street being located in part of Private Claims 32 and 33, East Side of the Fox River, City of De Pere, Brown County, Wisconsin, more fully described as follows:

Beginning at the Southeast corner of Lot 1, Volume 54, Certified Survey Maps, Page 312, Map No. 7902, Document No. 2415438, Brown County Records; thence N0°38'17"E, 128.47 feet along the East line of said Lot 1; thence 7.66 feet along said East line being the arc of a 10.00 foot radius curve to the left whose long chord bears N211°46.5"W, 7.47 feet; thence 25.27 feet along said East line being the arc of a 33.00 foot radius curve to the right whose long chord bears N21°17'46.5"W, 24.65 feet; thence

N0'38'17"W, 121.56 feet along said East line; thence 25.27 feet along said East line being the arc of a 33.00 foot radius curve to the right whose long chord bears N22'34'21.5"E, 24.65 feet; thence 7.66 feet along said East line being the arc of a 10.00 foot radius curve to the left whose long chord bears N22'34'21.5"E, 7.47 feet; thence NO'38'17"W, 12.27 feet along said East line; thence 6.19 feet along said East line being the arc of a 2.50 foot radius curve to the left whose long chord bears N70'17'54.5"W, 4.73 feet; thence 110.03 feet along the arc of a 304.50 foot radius curve to the left whose long chord bears N28'24'48"E, 109.43 feet; thence S89'21'02"E, 133.55 feet along the North right of way and it's extension of Charles Street; thence SO*38'58"W, 60.00 feet to the South right of way of said Charles Street; thence N89'21'02"W, 106.06 feet along said South right of way; thence SO'38'17"W, 106.50 feet along the East right of way of S Wisconsin Street; thence S89'21'43"E, 3.00 feet along said East right of way; thence S1'02'40"W, 253.77 feet along said East right of way, thence N89'21'26"W, 75.20 feet along the North right of way of Lewis Street to the point of beginning.

Road Vacation area contains 37,484 square feet / 0.86 acres more or less.

	CITY OF DE PERE APPLICATION FOR ROW VACATION	Fee: \$ 305.00 Receipt #: Date:
---	---	--

Read all instructions provided before completing. If additional space is needed, attach additional pages. Type or use black ink.

SECTION 1: Applicant / Permittee Information			
Applicant Name (Ind., Org. or Entity) De Pere Cultural Foundation, Inc.	Authorized Representative Rick Bilotto	Title Owner's Representative	
Mailing Address 231 S. Adams Street	City Green Bay	State WI	ZIP Code 54301
Email Address rick@theprgteam.com	Phone Number (incl. area code) 920-366-3783	Fax Number (incl. area code)	
SECTION 2: Landowner Information (complete these fields when project site owner is different than applicant)			
Name (Ind. Org. or Entity) City of De Pere	Contact Person Peter Schleinz	Title Senior Planner	
Mailing Address 335 S. Broadway	City De Pere	State WI	ZIP Code 54115
Email Address pschleinz@mail.de-pere.org	Phone Number (incl. area code) 920-339-4043	Fax Number (incl. area code)	
SECTION 3: Right of Way Requested to be Vacated			
Name of ROW: Legal Description to be Vacated: (Please attach map)	Right of way vacation of sections of Wisconsin St and Charles St		
SECTION 4: Reason of Vacation			
Reason for Requesting Vacation of ROW:	For use for the Mulva Cultural Center development		
SECTION 5: Certification and Permission			
Certification: I hereby certify that I am the owner or authorized representative for this Application. I certify that the information contained in this form and attachments is true and accurate.			
Name of Owner/Authorized Representative (please print) Rick Bilotto	Title Owner's Representative	Phone Number 920-366-3783	
Signature of Applicant <i>Rick Bilotto</i>		Date Signed March 6, 2020	

Part of Charles Street being located in part of Private Claims 32 and 33, East Side of the Fox River,
City of DePere, Brown County, Wisconsin



Drawing No.: L-11241



LEGAL DESCRIPTION OF ROAD TO BE VACATED

Part of Charles Street being located in part of Private Claims 32 and 33, East Side of the Fox River, City of DePere, Brown County, Wisconsin, more fully described as follows:

Beginning at the Northeast Corner of Lot 12, Block 27 of the "Original Plat of De Pere" Volume 1, Plats ,Page 23, Document number 17, Brown County Records; thence N89°21'02"W, 159.73 feet along the North line of said Lot 12 and its extension; thence 65.58 feet along the West right of way of Charles Street being the arc of a 304.50 foot radius curve to the left whose long chord bears N24°13'54"E, 65.46 feet; thence S89°21'02"E, 133.55 feet along the North right of way of Charles Street; thence S0°38'58"W, 60.00 feet to the point of beginning.

Road Vacation area contains 8,720 square feet / 0.20 acres more or less.

Curve Data

CURVE	ARC LENGTH	RADIUS	CHORD LENGTH	CHORD BEARING	CENTRAL ANGLE	TANGENT BEARING
C-1	65.58	304.50	65.46	N24°13'54"E	12°20'26"	N18°03'41"E, S30°24'07"W





City of De Pere, Wisconsin

Request For Common Council Action

MEETING DATE: November 17, 2020

DEPARTMENT: City Clerk

FROM: Carey Danen

SUBJECT: Voucher approval.

ATTACHMENTS:

- 11-17-20 VOUCHERS (PDF)

11/11/2020 10:43 AM

A / P CHECK REGISTER

PAGE: 1

PACKET: 06419 NOV 2020 COUNCIL 11-17-20

VENDOR SET: 01

**** CHECK LISTING ****

BANK : AP ASSOCIATED

VENDOR	NAME / I.D.	DESC	CHECK TYPE	CHECK DATE	DISCOUNT	AMOUNT	CHECK NO#	CHECK AMOUNT
0001	A1 ELEVATOR CORP I-16758	A1 ELEVATOR CORP	R	11/17/2020		33.59CR	093856	33.59
7583	ADVANCE AUTO PARTS I-6339-292609	ADVANCE AUTO PARTS	R	11/17/2020		12.21CR	093857	12.21
6802	ADVANCED DISPOSAL I-B80000725767	ADVANCED DISPOSAL	R	11/17/2020		581.46CR	093858	581.46
0302	AIRGAS USA LLC I-9106107279 I-9973788318	AIRGAS USA LLC AIRGAS USA LLC	R R	11/17/2020 11/17/2020		297.80CR 198.12CR	093859 093859	 495.92
6406	ALLIANCE CONSTRUCTION & DESIGN I-2880	ALLIANCE CONSTRUCTION & DESIGN	R	11/17/2020		39,776.00CR	093860	39,776.00
7700	AMERICAN TRADE MARK CO INC I-3038	AMERICAN TRADE MARK CO INC	R	11/17/2020		2,052.55CR	093861	2,052.55
3962	AMERICAN WATER WORKS ASSOCIATION I-26660	AMERICAN WATER WORKS ASSOCIATI	R	11/17/2020		4,100.00CR	093862	4,100.00
1781	ASPHALT SEAL & REPAIR INC I-20-13 (1)	ASPHALT SEAL & REPAIR INC	R	11/17/2020		136,327.81CR	093863	136,327.81
5604	AURORA BAYCARE MED CTR LLC I-KY525	AURORA BAYCARE MED CTR LLC	R	11/17/2020		146.12CR	093864	146.12
0442	BADGER LABORATORIES INC I-20-50030527	BADGER LABORATORIES INC	R	11/17/2020		560.00CR	093865	560.00
0020	BADGERLAND PRINTING INC I-35730 I-35737 I-35741 I-35743	BADGERLAND PRINTING INC BADGERLAND PRINTING INC BADGERLAND PRINTING INC BADGERLAND PRINTING INC	R R R R	11/17/2020 11/17/2020 11/17/2020 11/17/2020		16.00CR 175.00CR 341.28CR 792.30CR	093866 093866 093866 093866	 1,324.58
0027	BAY TOWEL INC I-4039667 I-4047651 I-4051600 I-4053935	BAY TOWEL INC BAY TOWEL INC BAY TOWEL INC BAY TOWEL INC	R R R R	11/17/2020 11/17/2020 11/17/2020 11/17/2020		117.98CR 117.98CR 117.98CR 95.82CR	093867 093867 093867 093867	 449.76

11/11/2020 10:43 AM

A / P CHECK REGISTER

PAGE: 2

PACKET: 06419 NOV 2020 COUNCIL 11-17-20

VENDOR SET: 01

**** CHECK LISTING ****

BANK : AP ASSOCIATED

VENDOR	NAME / I.D.	DESC	CHECK TYPE	CHECK DATE	DISCOUNT	AMOUNT	CHECK NO#	CHECK AMOUNT
0028	BAY VERTE MACHINERY INC I-412888-00	BAY VERTE MACHINERY INC	R	11/17/2020		204.98CR	093868	204.98
6473	BEAVER OF WISCONSIN INC I-103695	BEAVER OF WISCONSIN INC	R	11/17/2020		388.75CR	093869	388.75
8276	RANDY BECKS I-202011101172	RANDY BECKS	R	11/17/2020		330.00CR	093870	330.00
0038	BROADWAY AUTOMOTIVE INC I-509399P I-512022P I-513293P	BROADWAY AUTOMOTIVE INC BROADWAY AUTOMOTIVE INC BROADWAY AUTOMOTIVE INC	R R R	11/17/2020 11/17/2020 11/17/2020		225.61CR 22.61CR 80.04CR	093871 093871 093871	 328.26
0039	BROOKS TRACTOR INC I-381625	BROOKS TRACTOR INC	R	11/17/2020		18,052.99CR	093872	18,052.99
0536	CDW GOVERNMENT INC I-3166030	CDW GOVERNMENT INC	R	11/17/2020		604.31CR	093873	604.31
2708	CLEANING SOLUTION SERVICES INC I-20770B I-20836B I-20902 I-20910 I-20913 I-20940 I-20959	CLEANING SOLUTION SERVICES INC CLEANING SOLUTION SERVICES INC CLEANING SOLUTION SERVICES INC CLEANING SOLUTION SERVICES INC CLEANING SOLUTION SERVICES INC CLEANING SOLUTION SERVICES INC CLEANING SOLUTION SERVICES INC	R R R R R R R	11/17/2020 11/17/2020 11/17/2020 11/17/2020 11/17/2020 11/17/2020 11/17/2020		771.28CR 771.28CR 381.59CR 2,354.44CR 2,175.00CR 561.95CR 196.51CR	093874 093874 093874 093874 093874 093874 093874	 7,212.05
7997	COMPLETE OFFICE I-AR23130 I-AR23132 I-AR23133	COMPLETE OFFICE COMPLETE OFFICE COMPLETE OFFICE	R R R	11/17/2020 11/17/2020 11/17/2020		38.83CR 29.56CR 35.37CR	093875 093875 093875	 103.76
7782	CONWAY SHIELD I-465330-IN	CONWAY SHIELD	R	11/17/2020		1,215.29CR	093876	1,215.29
7639	CORE & MAIN LP I-N246260	CORE & MAIN LP	R	11/17/2020		835.25CR	093877	835.25
7288	JESSICA DART I-202011101177	JESSICA DART	R	11/17/2020		26.48CR	093878	26.48

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VENDOR	NAME / I.D.	DESC	CHECK TYPE	CHECK DATE	DISCOUNT	AMOUNT	CHECK NO#	CHECK AMOUNT
1436	DE PERE AREA CHAMBER OF COMMERCE I-13173	DE PERE AREA CHAMBER OF COMMER	R	11/17/2020		157.00CR	093879	157.00
2077	DE PERE EXHAUST I-58175	DE PERE EXHAUST	R	11/17/2020		116.28CR	093880	116.28
7769	DE PERE FIRE DEPT I-202011101173	DE PERE FIRE DEPT	R	11/17/2020		479.08CR	093881	479.08
0917	RICK W DE WEERT I-202011101174	RICK W DE WEERT	R	11/17/2020		35.00CR	093882	35.00
0085	EMERGENCY MEDICAL PRODUCTS INC I-2209539 I-2210389 I-2210949 I-2210950	EMERGENCY MEDICAL PRODUCTS INC EMERGENCY MEDICAL PRODUCTS INC EMERGENCY MEDICAL PRODUCTS INC EMERGENCY MEDICAL PRODUCTS INC	R R R R	11/17/2020 11/17/2020 11/17/2020 11/17/2020		1,040.90CR 544.90CR 17.96CR 207.92CR	093883 093883 093883 093883	 1,811.68
0086	ERC INC I-1020-1055	ERC INC	R	11/17/2020		429.00CR	093884	429.00
7422	EXCEL UNDERGROUND LLC I-8485	EXCEL UNDERGROUND LLC	R	11/17/2020		8,377.63CR	093885	8,377.63
0092	FEAKER & SONS CO INC I-20-04 (2)	FEAKER & SONS CO INC	R	11/17/2020		339,974.52CR	093886	339,974.52
0331	FERGUSON WATERWORKS #1476 INC I-316750 I-317250 I-317253 I-317255	FERGUSON WATERWORKS #1476 INC FERGUSON WATERWORKS #1476 INC FERGUSON WATERWORKS #1476 INC FERGUSON WATERWORKS #1476 INC	R R R R	11/17/2020 11/17/2020 11/17/2020 11/17/2020		1,011.00CR 1,636.12CR 344.88CR 528.60CR	093887 093887 093887 093887	 3,520.60
0096	FIRE APPARATUS & EQUIPMENT INC I-21553	FIRE APPARATUS & EQUIPMENT INC	R	11/17/2020		112.76CR	093888	112.76
0200	FIRST SUPPLY LLC I-12438903-00 I-12446654-00	FIRST SUPPLY LLC FIRST SUPPLY LLC	R R	11/17/2020 11/17/2020		4.40CR 18.91CR	093889 093889	 23.31
0105	FOX SPECIALITY COMPANY I-446771	FOX SPECIALITY COMPANY	R	11/17/2020		75.36CR	093890	75.36

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BANK : AP ASSOCIATED

VENDOR	NAME / I.D.	DESC	CHECK TYPE	CHECK DATE	DISCOUNT	AMOUNT	CHECK NO#	CHECK AMOUNT
0107	FOX VALLEY TECHNICAL COLLEGE I-AR31066	FOX VALLEY TECHNICAL COLLEGE	R	11/17/2020		1,215.00CR	093891	1,215.00
1068	FOX VALLEY TRUCK & BODY INC I-53919	FOX VALLEY TRUCK & BODY INC	R	11/17/2020		611.57CR	093892	611.57
4176	FRANK'S RADIO SERVICE INC I-117264	FRANK'S RADIO SERVICE INC	R	11/17/2020		540.00CR	093893	540.00
3655	FUN EXPRESS LLC I-705918079-01	FUN EXPRESS LLC	R	11/17/2020		85.68CR	093894	85.68
0562	GALLS LLC I-16769478 I-16805820	GALLS LLC GALLS LLC	R R	11/17/2020 11/17/2020		79.69CR 136.66CR	093895 093895	 216.35
5830	GRAEF INC I-112308	GRAEF INC	R	11/17/2020		22,952.40CR	093896	22,952.40
0116	GRAINGER INC I-9686192213	GRAINGER INC	R	11/17/2020		38.40CR	093897	38.40
0446	HAWKINS INC I-4813805	HAWKINS INC	R	11/17/2020		3,457.19CR	093898	3,457.19
1244	HOWARD IMMEL INC I-20-18 (4)	HOWARD IMMEL INC	R	11/17/2020		711,574.30CR	093899	711,574.30
5484	HYDROCORP INC I-59579-IN	HYDROCORP INC	R	11/17/2020		2,648.00CR	093900	2,648.00
1399	INDOFF INC I-3416917 I-3418688 I-3419104	INDOFF INC INDOFF INC INDOFF INC	R R R	11/17/2020 11/17/2020 11/17/2020		169.10CR 340.02CR 49.41CR	093901 093901 093901	 558.53
6529	JANKE GENERL CONTRACTORS INC I-19-22 FINAL	JANKE GENERL CONTRACTORS INC	R	11/17/2020		14,029.20CR	093902	14,029.20
2602	JOSSART BROTHERS INC I-19-09 (4) FINAL I-1913 I-1928 I-20-02 (3)	JOSSART BROTHERS INC JOSSART BROTHERS INC JOSSART BROTHERS INC JOSSART BROTHERS INC	R R R R	11/17/2020 11/17/2020 11/17/2020 11/17/2020		18,918.19CR 2,222.10CR 1,474.40CR 555,063.30CR	093903 093903 093903 093903	 577,677.99

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BANK : AP ASSOCIATED

VENDOR	NAME / I.D.	DESC	CHECK TYPE	CHECK DATE	DISCOUNT	AMOUNT	CHECK NO#	CHECK AMOUNT
1276	JX ENTERPRISES INC							
	C-14146909P	JX ENTERPRISES INC	R	11/17/2020		301.00	093904	
	I-14144260P	JX ENTERPRISES INC	R	11/17/2020		148.33CR	093904	
	I-14144888P	JX ENTERPRISES INC	R	11/17/2020		88.88CR	093904	
	I-14144948P	JX ENTERPRISES INC	R	11/17/2020		246.40CR	093904	
	I-14145214P	JX ENTERPRISES INC	R	11/17/2020		56.31CR	093904	
	I-14145240P	JX ENTERPRISES INC	R	11/17/2020		43.80CR	093904	
	I-14145325P	JX ENTERPRISES INC	R	11/17/2020		204.57CR	093904	
	I-14146362P	JX ENTERPRISES INC	R	11/17/2020		58.92CR	093904	
	I-14146416P	JX ENTERPRISES INC	R	11/17/2020		9.53CR	093904	
	I-14146609P	JX ENTERPRISES INC	R	11/17/2020		257.02CR	093904	
	I-14146770P	JX ENTERPRISES INC	R	11/17/2020		6.59CR	093904	
	I-14146893P	JX ENTERPRISES INC	R	11/17/2020		362.99CR	093904	1,182.34
3140	KUNDINGER FLUID POWER INC							
	I-50615110	KUNDINGER FLUID POWER INC	R	11/17/2020		430.35CR	093905	430.35
2289	KUSSMAUL ELECTRONICS CO INC							
	I-178093	KUSSMAUL ELECTRONICS CO INC	R	11/17/2020		154.50CR	093906	154.50
0153	LAFORCE INC							
	I-1145972	LAFORCE INC	R	11/17/2020		744.00CR	093907	
	I-1146667	LAFORCE INC	R	11/17/2020		370.56CR	093907	1,114.56
7063	LEAVES INSPIRED TREE NURSERY LLC							
	I-534	LEAVES INSPIRED TREE NURSERY L	R	11/17/2020		12,583.00CR	093908	12,583.00
7729	BONNIE LINSEN							
	I-202011101175	BONNIE LINSEN	R	11/17/2020		150.00CR	093909	150.00
7446	MACQUEEN EQUIPMENT GROUP							
	I-P16800	MACQUEEN EQUIPMENT GROUP	R	11/17/2020		405.25CR	093910	
	I-P17034	MACQUEEN EQUIPMENT GROUP	R	11/17/2020		3,197.60CR	093910	3,602.85
5675	MAGNA-MATIC							
	I-66826	MAGNA-MATIC	R	11/17/2020		73.87CR	093911	73.87
4498	MC MAHON ASSOC INC							
	I-601714	MC MAHON ASSOC INC	R	11/17/2020		1,298.00CR	093912	1,298.00
0163	MCC INC							
	I-20-07 (2)	MCC INC	R	11/17/2020		443,705.54CR	093913	443,705.54

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VENDOR	NAME / I.D.	DESC	CHECK TYPE	CHECK DATE	DISCOUNT	AMOUNT	CHECK NO#	CHECK AMOUNT
0173	MENARDS INC							
	I-73392	MENARDS INC	R	11/17/2020		103.60CR	093914	
	I-73699	MENARDS INC	R	11/17/2020		70.96CR	093914	
	I-73769	MENARDS INC	R	11/17/2020		26.30CR	093914	
	I-73876	MENARDS INC	R	11/17/2020		27.94CR	093914	
	I-74102	MENARDS INC	R	11/17/2020		99.94CR	093914	
	I-74110	MENARDS INC	R	11/17/2020		46.89CR	093914	
	I-74139	MENARDS INC	R	11/17/2020		48.97CR	093914	
	I-74160	MENARDS INC	R	11/17/2020		85.81CR	093914	
	I-74165	MENARDS INC	R	11/17/2020		42.80CR	093914	
	I-74211	MENARDS INC	R	11/17/2020		43.78CR	093914	
	I-74218	MENARDS INC	R	11/17/2020		50.87CR	093914	
	I-74235	MENARDS INC	R	11/17/2020		39.84CR	093914	
	I-74334	MENARDS INC	R	11/17/2020		8.97CR	093914	
	I-74384	MENARDS INC	R	11/17/2020		46.25CR	093914	
	I-74424	MENARDS INC	R	11/17/2020		19.56CR	093914	
	I-74481	MENARDS INC	R	11/17/2020		33.00CR	093914	795.48
VOID	VOID CHECK		V	11/17/2020			093915	**VOID**
3191	NCI							
	I-AR19865	NCI	R	11/17/2020		49.90CR	093916	49.90
0531	NORTHEAST AUTO PARTS INC							
	I-351476	NORTHEAST AUTO PARTS INC	R	11/17/2020		35.98CR	093917	
	I-351526	NORTHEAST AUTO PARTS INC	R	11/17/2020		61.62CR	093917	
	I-351536	NORTHEAST AUTO PARTS INC	R	11/17/2020		7.40CR	093917	
	I-351538	NORTHEAST AUTO PARTS INC	R	11/17/2020		37.20CR	093917	
	I-351566	NORTHEAST AUTO PARTS INC	R	11/17/2020		43.80CR	093917	
	I-351727	NORTHEAST AUTO PARTS INC	R	11/17/2020		15.99CR	093917	
	I-351756	NORTHEAST AUTO PARTS INC	R	11/17/2020		92.76CR	093917	
	I-351762	NORTHEAST AUTO PARTS INC	R	11/17/2020		6.16CR	093917	300.91
5433	NORTHEAST WI TECH COLLEGE							
	I-CS34483	NORTHEAST WI TECH COLLEGE	R	11/17/2020		20.00CR	093918	20.00
3250	NORTHERN LAKE SERVICE							
	I-389339	NORTHERN LAKE SERVICE	R	11/17/2020		560.00CR	093919	560.00
0197	PACKER CITY INTL TRUCKS INC							
	I-X101132812:01	PACKER CITY INTL TRUCKS INC	R	11/17/2020		248.34CR	093920	248.34

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BANK : AP ASSOCIATED

VENDOR	NAME / I.D.	DESC	CHECK TYPE	CHECK DATE	DISCOUNT	AMOUNT	CHECK NO#	CHECK AMOUNT
0208	POMP'S TIRE SERVICE INC							
	I-90067599	POMP'S TIRE SERVICE INC	R	11/17/2020		28.00CR	093921	
	I-90067815	POMP'S TIRE SERVICE INC	R	11/17/2020		494.18CR	093921	
	I-90067834	POMP'S TIRE SERVICE INC	R	11/17/2020		2,314.00CR	093921	2,836.18
1246	PREVEA HEALTH							
	I-129436	PREVEA HEALTH	R	11/17/2020		563.10CR	093922	563.10
8277	R BAUMAN & ASSOCIATES SC							
	I-1013	R BAUMAN & ASSOCIATES SC	R	11/17/2020		905.40CR	093923	905.40
6948	RAY'S TIRE							
	I-1015433	RAY'S TIRE	R	11/17/2020		1,524.00CR	093924	1,524.00
0225	RED D MIX CONCRETE INC							
	I-79022	RED D MIX CONCRETE INC	R	11/17/2020		271.20CR	093925	271.20
0227	REINDERS INC							
	I-1854111-00	REINDERS INC	R	11/17/2020		87.57CR	093926	87.57
7371	RJM CONSTRUCTION LLC							
	I-20-05 (1)	RJM CONSTRUCTION LLC	R	11/17/2020		80,609.96CR	093927	80,609.96
0158	ROBERT E LEE & ASSOCIATES INC							
	I-78537	ROBERT E LEE & ASSOCIATES INC	R	11/17/2020		3,960.71CR	093928	3,960.71
7596	ROCKEY FENCE LLC							
	I-2020072B	ROCKEY FENCE LLC	R	11/17/2020		500.00CR	093929	500.00
6268	SANBORN MAP CO INC							
	I-COS00008150	SANBORN MAP CO INC	R	11/17/2020		11,309.38CR	093930	11,309.38
3234	SHERWIN WILLIAMS							
	I-3024-8	SHERWIN WILLIAMS	R	11/17/2020		123.65CR	093931	
	I-3389-5	SHERWIN WILLIAMS	R	11/17/2020		27.98CR	093931	
	I-966-4	SHERWIN WILLIAMS	R	11/17/2020		28.05CR	093931	179.68
0252	SOUTHSIDE TIRE CO INC							
	I-3093416	SOUTHSIDE TIRE CO INC	R	11/17/2020		49.94CR	093932	49.94
6745	STANLEY STEEMER							
	I-163231	STANLEY STEEMER	R	11/17/2020		144.00CR	093933	144.00

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VENDOR	NAME / I.D.	DESC	CHECK TYPE	CHECK DATE	DISCOUNT	AMOUNT	CHECK NO#	CHECK AMOUNT
4094	STATE BAR OF WISCONSIN							
	I-5083432	STATE BAR OF WISCONSIN	R	11/17/2020		159.30CR	093934	159.30
8149	SUPERIOR SEWER AND WATER INC							
	I-20-01A (6)	SUPERIOR SEWER AND WATER INC	R	11/17/2020		68,488.66CR	093935	68,488.66
0268	TRUCK EQUIPMENT INC							
	I-922211-00	TRUCK EQUIPMENT INC	R	11/17/2020		55.11CR	093936	
	I-923557-00	TRUCK EQUIPMENT INC	R	11/17/2020		118.44CR	093936	
	I-923873-00	TRUCK EQUIPMENT INC	R	11/17/2020		12.62CR	093936	
	I-925008-00	TRUCK EQUIPMENT INC	R	11/17/2020		86.48CR	093936	272.65
0416	TWIRL SEWER SERVICE							
	I-30813	TWIRL SEWER SERVICE	R	11/17/2020		350.00CR	093937	350.00
3858	ULINE							
	I-125622112	ULINE	R	11/17/2020		400.07CR	093938	400.07
0272	UNIFORM SHOPPE INC							
	I-304021	UNIFORM SHOPPE INC	R	11/17/2020		32.00CR	093939	
	I-304025	UNIFORM SHOPPE INC	R	11/17/2020		62.95CR	093939	
	I-304111	UNIFORM SHOPPE INC	R	11/17/2020		20.00CR	093939	
	I-304113	UNIFORM SHOPPE INC	R	11/17/2020		20.00CR	093939	
	I-304114	UNIFORM SHOPPE INC	R	11/17/2020		40.00CR	093939	
	I-304115	UNIFORM SHOPPE INC	R	11/17/2020		32.00CR	093939	
	I-304116	UNIFORM SHOPPE INC	R	11/17/2020		95.95CR	093939	
	I-304120	UNIFORM SHOPPE INC	R	11/17/2020		298.80CR	093939	
	I-304317	UNIFORM SHOPPE INC	R	11/17/2020		68.95CR	093939	
	I-304319	UNIFORM SHOPPE INC	R	11/17/2020		90.95CR	093939	
	I-304320	UNIFORM SHOPPE INC	R	11/17/2020		115.90CR	093939	
	I-304321	UNIFORM SHOPPE INC	R	11/17/2020		24.00CR	093939	
	I-304322	UNIFORM SHOPPE INC	R	11/17/2020		44.00CR	093939	
	I-304453	UNIFORM SHOPPE INC	R	11/17/2020		52.00CR	093939	
	I-304511	UNIFORM SHOPPE INC	R	11/17/2020		68.95CR	093939	
	I-304512	UNIFORM SHOPPE INC	R	11/17/2020		20.00CR	093939	1,086.45
VOID	VOID CHECK		V	11/17/2020			093940	**VOID**
0277	VAN'S FIRE & SAFETY INC							
	I-4140826	VAN'S FIRE & SAFETY INC	R	11/17/2020		70.40CR	093941	
	I-4140828	VAN'S FIRE & SAFETY INC	R	11/17/2020		474.04CR	093941	544.44

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BANK : AP ASSOCIATED

VENDOR	NAME / I.D.	DESC	CHECK TYPE	CHECK DATE	DISCOUNT	AMOUNT	CHECK NO#	CHECK AMOUNT
7210	VANDEN PLAS PORTABLE SOLUTIONS LLC							
	I-3488	VANDEN PLAS PORTABLE SOLUTIONS	R	11/17/2020		256.00CR	093942	256.00
3767	VDH ELECTRIC INC							
	I-23193	VDH ELECTRIC INC	R	11/17/2020		385.00CR	093943	385.00
3707	VIKING ELECTRIC SUPPLY							
	I-S004073484.001	VIKING ELECTRIC SUPPLY	R	11/17/2020		27.82CR	093944	
	I-S004090591.001	VIKING ELECTRIC SUPPLY	R	11/17/2020		57.30CR	093944	
	I-S004092784.001	VIKING ELECTRIC SUPPLY	R	11/17/2020		751.88CR	093944	
	I-S004109190.001	VIKING ELECTRIC SUPPLY	R	11/17/2020		134.51CR	093944	
	I-S004133464.001	VIKING ELECTRIC SUPPLY	R	11/17/2020		138.53CR	093944	
	I-S004138236.001	VIKING ELECTRIC SUPPLY	R	11/17/2020		38.57CR	093944	1,148.61
8043	WASTEBUILT ENVIRON SOLUTIONS							
	I-3495017	WASTEBUILT ENVIRON SOLUTIONS	R	11/17/2020		322.38CR	093945	322.38
4619	WATER TOWER CLEAN & COAT INC							
	I-WT78493	WATER TOWER CLEAN & COAT INC	R	11/17/2020		4,750.00CR	093946	4,750.00
0238	WAUSAU EQUIPMENT CO INC							
	I-7267493	WAUSAU EQUIPMENT CO INC	R	11/17/2020		2,154.08CR	093947	2,154.08
0282	WESCO RECEIVABLES CORP							
	I-52840	WESCO RECEIVABLES CORP	R	11/17/2020		58.05CR	093948	
	I-59320	WESCO RECEIVABLES CORP	R	11/17/2020		116.10CR	093948	174.15
2645	WI DEPT OF JUSTICE							
	I-202011101176	WI DEPT OF JUSTICE	R	11/17/2020		21.00CR	093949	21.00
6469	WI DOCUMENT IMAGING							
	I-116733	WI DOCUMENT IMAGING	R	11/17/2020		580.81CR	093950	580.81
7350	WI MEDIA							
	I-3579537	WI MEDIA	R	11/17/2020		667.27CR	093951	667.27

* * T O T A L S * *	NO#	DISCOUNTS	CHECK AMT	TOTAL APPLIED
REGULAR CHECKS:	94	0.00	2,556,850.58	2,556,850.58
HANDWRITTEN CHECKS:	0	0.00	0.00	0.00
PRE-WRITE CHECKS:	0	0.00	0.00	0.00
DRAFTS:	0	0.00	0.00	0.00
VOID CHECKS:	2	0.00	0.00	0.00
NON CHECKS:	0	0.00	0.00	0.00
CORRECTIONS:	0	0.00	0.00	0.00
REGISTER TOTALS:	96	0.00	2,556,850.58	2,556,850.58

TOTAL ERRORS: 0

TOTAL WARNINGS: 0

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BANK : AP ASSOCIATED

VENDOR	NAME / I.D.	DESC	CHECK TYPE	CHECK DATE	DISCOUNT	AMOUNT	CHECK NO#	CHECK AMOUNT
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** POSTING PERIOD RECAP **

FUND	PERIOD	AMOUNT
100	11/2020	76,040.71CR
201	11/2020	10,310.69CR
208	11/2020	36.45CR
296	11/2020	3,960.71CR
405	11/2020	2,369,674.56CR
415	11/2020	41,074.00CR
601	11/2020	36,518.20CR
650	11/2020	19,235.26CR
=====		
ALL		2,556,850.58CR

**City of De Pere, Wisconsin****Request For Common Council Action**

MEETING DATE: November 17, 2020

DEPARTMENT: City Clerk

FROM: Carey Danen

SUBJECT: COVID-19 update from the Health Department.



City of De Pere, Wisconsin

Request For Common Council Action

MEETING DATE: November 17, 2020

DEPARTMENT: City Clerk

FROM: Carey Danen

SUBJECT: Future agenda items.
