City of Flint, Michigan

Third Floor, City Hall
1101 S. Saginaw Street
Flint, Michigan 48502
www.cityofflint.com

Meeting Agenda - Final

Wednesday, July 21, 2021

5:00 PM

Agenda Amended to Add Appointment Resolution 210335

ELECTRONIC PUBLIC MEETING

GOVERNMENTAL OPERATIONS COMMITTEE

Eva L. Worthing, Chairperson, Ward 9
Maurice D. Davis, Vice Chairperson, Ward 2

Eric Mays, Ward 1
Kate Fields, Ward 4
Herbert J. Winfrey, Ward 6
Santino J. Guerra, Ward 3
Jerri Winfrey-Carter, Ward 5
Monica Galloway, Ward 7
Allan Griggs, Ward 8

Inez M. Brown, City Clerk
Davina Donahue, Deputy City Clerk

SPECIAL PUBLIC NOTICE -- ELECTRONIC PUBLIC MEETING

PUBLIC NOTICE
FLINT CITY COUNCIL ELECTRONIC PUBLIC MEETING

On Friday, October 5, 2020, the Michigan Supreme Court (MSC) issued an order declaring that the Emergency Powers of Governor (EPG) Act as an unconstitutional delegation of legislative authority, which was the primary authority relied on by Governor Whitmer for her COVID-19 related executive orders. Subsequently, Governor Whitmer requested that the MSC clarify that their order does not go into effect until October 30, 2020. On Monday October 12, 2020, the Michigan Supreme Court rejected Governor Whitmer's request to delay the effect of its decision to strike down the EPG. On, Tuesday, October 13, 2020, Senate Bill 1108 passed, amending the Open Meetings Act to allow municipalities to hold electronic meetings. On Friday, October 16, 2020, Governor Whitmer signed into law Senate Bill 1108 amending the Open Meetings Act. Subsequently, on December 22, 2020, Public Act 267 of 1976 was amended through Senate Bill 1246 extending the electronic meetings with no reason through March 31, 2021. The act also allows that after March 31, 2021, electronic meetings may be held if a local state of emergency was declared. On March 23, 2020, the Flint City Council extended Mayor Neeley's declaration of emergency indefinitely due to the COVID-19 pandemic. Therefore, this meeting will be held electronically.

Pursuant to Act 267 of the Public Acts of 1976 Open Meetings Act as amended and Flint City Charter Section 3-202, notice is hereby given that the Flint City Council hereby calls for Regular Meetings of the Flint City Council scheduled to be held as follows:

Flint City Council Committee Meetings
(Finance, Governmental Operations, Legislative & Grants)
Wednesday, July 21, 2021, at 5 p.m.

The public and media may listen to the meeting online by live stream at <https://www.youtube.com/channel/UCp2cWTuocUM3awU4xXWzwaw> or through Start Meeting by dialing (617) 944-8177. If unable to call in, please dial (206) 451-6011.

1. In order to speak during the PUBLIC SPEAKING PERIOD of each meeting by telephone, participants will also call (617) 944-8177. (If unable to call in, please dial (206) 451-6011):

a. All callers will be queued and muted until the Public Speaking portion of each agenda;

b. Public speakers will be unmuted in order and asked if they wish to address the City Council ON ANY SUBJECT;

c. Public speakers should state and spell their name for the record and will be allowed two (2) minutes for public speaking during each meeting;

d. The speaker will be returned to mute after the 2 minutes have expired;

e. After the telephonic public speakers for the last committee meeting are completed, emailed public comments will be read by the City Clerk. All emailed public comments will be timed for 2 minutes;

f. Per Rules Governing Meetings of the Council (Rule 7.1 VII), there will only be one speaking opportunity per speaker per meeting. Consequently, public participants who call in and speak during the public speaking period of the meetings WILL NOT have written comments as submitted read by the City Clerk.

2. The public may send public comments by email to CouncilPublicComment@cityofflint.com no later than 10 minutes prior to the meeting start time of 5 p.m.

3. Persons with disabilities may participate in the meeting by the above-mentioned means or by emailing a request for an accommodation to CouncilPublicComment@cityofflint.com, with the subject line Request for Accommodation, or by contacting the City Clerk at (810) 766-7418 to request

accommodation - including but not limited to interpreters.

If there are any questions concerning this notice, please direct them to City Council office at (810) 766-7418.

ROLL CALL

MEMBER REMOTE ANNOUNCEMENT

Pursuant to the newly revised Open Meetings Act, each Council member shall state that they are attending the meeting remotely and shall state where he or she is physically located (county or city and state).

MEMBER CONTACT INFORMATION

Eric Mays - (810) 922-4860; Maurice Davis - mdavis@cityofflint.com; Santino Guerra - sguerra@cityofflint.com; Kate Fields - kfields@cityofflint.com; Jerri Winfrey-Carter - jwinfrey-carter@cityofflint.com; Herbert Winfrey - (810) 691-7463; Monica Galloway - mgalloway@cityofflint.com; Allan Griggs - agriggs@cityofflint.com; Eva Worthing - eworthing@cityofflint.com.

PROCEDURES ON CONDUCTING ELECTRONIC MEETINGS

All boards and commissions must adhere to all laws established under the Michigan Compiled Laws and in accordance with the revisions to the Open Meetings Act adopted in Senate Bill 1246, as passed on December 17, 2020, and signed into law on December 22, 2020, and subsequent amendments that may be adopted.

READING OF DISORDERLY PERSONS CITY CODE SUBSECTION

Section 31-10, Disorderly Conduct, Assault and Battery, and Disorderly Persons, and will be subject to arrest for a misdemeanor. Any person who prevents the peaceful and orderly conduct of any meeting will be given one warning. If they persist in disrupting the meeting, that individual will be subject to arrest. Violators shall be removed from meetings.

PUBLIC SPEAKING

Per the amended Rules Governing Meetings of the Council (as adopted by the City Council on Monday, June 12, 2017), two (2) minutes per speaker. Only one speaking opportunity per speaker.

COUNCIL RESPONSE

Per the amended Rules Governing Meetings of the Council (as adopted by the City Council on Monday, June 12, 2017), Councilpersons may respond to any public speaker, but only one response and only when all public speakers have been heard. Individual council response is limited to two minutes.

SPECIAL ORDERS

210276 Special Order/Master Fee Schedule/Street Light Fees

A Special Order as requested by Council Vice President Davis to discuss street light fees in the Master Fee Schedule.

210277 Special Order/Rental Inspections/City of Flint

A Special Order as requested by Councilperson Galloway to discuss rental inspections in the City of Flint.

RESOLUTIONS

210233.1 Approval/City of Flint Brownfield Redevelopment Project Authority/Brownfield Plan for the James P. Cole Project (1809 James P. Cole Boulevard)

Resolution resolving that the [Brownfield Plan for the James P. Cole Project (1809 James P. Cole Boulevard)] as submitted is hereby approved and adopted, and a copy of the plan and all amendments thereto shall be maintained on file in the City Clerk's office. [NOTE: Once approved, the Brownfield plan will allow the reimbursement of eligible project expenses from the additional tax revenue realized as a result of the redevelopment. The reimbursement can occur over the life of the plan, which is normally 30 years. The eligible reimbursable expenses are estimated at around $2,541,508.00.]

210271 Approval/Include Public Servants/City of Flint Policies, Procedures & Regulations

Resolution resolving that the Flint City Council includes and incorporates by reference that all city policies, procedures and regulations shall uniformly apply to public servants, as defined in the City Charter, and, furthermore authorizes the Human Resources Director to enforce current and future city policies, procedures and regulations equally and uniformly to public servants.

210272 Approval/City of Flint/Policy/Multi-Year Contracts

Resolution resolving that the Purchasing policy regarding multi-year contracts allows for the original resolution to serve as approval for each year of the contract, assuming no changes in price or terms.

210331 Resolution Switching to Even-Numbered Year Elections

Resolution resolving that the Flint City Council adopts this resolution switching to even-numbered year elections, AND, resolving that the City Clerk will file this resolution with the Secretary of State forthwith, AND, resolving that after December 31, 2021, the city's regular election will take place at the even-year General Election and its primary election at the even-year Primary Election. [The newly revised Flint City Charter, which became effective on January 1, 2018, states "The City Council shall adopt, in 2021, a resolution required to switch to even-numbered year elections as authorized by MCL 168-642 and 168.642a." A Public Hearing on the matter will be held at 5:30 p.m. Monday, July 26, 2021.]

APPOINTMENTS

210157 Appointment/Water System Advisory Council/Nancy Love

Resolution resolving that Mayor Neeley hereby appoints Nancy Love (1351 Beal Avenue, Ann Arbor, MI 48109) to serve on the Water System Advisory Council. [NOTE: Pursuant to the State of Michigan's administrative rules, water suppliers serving a population of 50,000 or more, shall create a Water System Advisory Council. The purpose of the Council is to improve transparency in the City of Flint community by developing materials and advising the water system on public awareness and education efforts.]

210229 Appointment/Water System Advisory Council/Shawn P. McElmurry

Resolution resolving that Mayor Neeley hereby appoints Shawn P. McElmurry (2153 Engineering Building, 5050 Anthony Wayne Drive, Detroit, MI 48202) to serve on the Water System Advisory Council. [NOTE: Pursuant to the State of Michigan's administrative rules, water suppliers serving a population of 50,000 or more, shall create a Water System Advisory Council. The purpose of the Council is to improve transparency in the City of Flint community by developing materials and advising the water system on public awareness and education efforts.]

210313 Appointment/Hurley Board of Hospital Managers/Mildred Silva Zuccaro

Resolution approving that the Flint City Council approves the appointment of Mildred Silva Zuccaro (no address listed) to the Hurley Board of Hospital Managers to serve the remainder of a five-year term commencing immediately, and expiring April 30, 2022, as requested by Mayor Sheldon Neeley. [NOTE: Ms. Zuccaro is replacing the Rev. Daniel S. Scheid, who recently resigned from the board.]

210335 Reappointment/Zoning Board of Appeals/Matthew Telliga (Ward 8)

Resolution resolving that Matthew Telliga (3330 Westwood Parkway, Flint, MI 48503 -- Ward 8) is reappointed to the Zoning Board of Appeals for a three-year term, beginning immediately and ending March 31, 2023. [By way of background, Mr. Telliga's term on the Zoning Board of Appeals expired March 31, 2020, however, he continued to serve.]

OUTSTANDING DISCUSSION ITEMS

210210 Referral/Monthly Reports/Drinking Water Quality

Referral by Councilperson Griggs to PUBLIC HEALTH ADVISOR, re: He would like for the city's Public Health Advisor to provide monthly drinking water quality reports. [Referral Action Date: 4/22/2021 @ City Council Grants Committee Electronic Public Meeting.]

210208 Referral/Conversion to LED Lights

Referral as requested by Councilperson Fields to ADMINISTRATION: re, She asks that the administration look into large-scale conversion to LED lights. [Referral Action Date: 4/22/2021 @ City Council Governmental Operations Committee

Electronic Public Meeting.]

210205 Discussion Item/Names of Those Driving City-Owned Vehicles

Referral by Councilperson Mays to ADMIN/FLEET, re: He would like the names of employees/appointees driving city-owned vehicles. [Referral Action Date: 4/14/2021 @ City Council Electronic Public Meeting.]

210118 Discussion Item/Snow Plowing Strategy

A Discussion Item as requested by Councilperson Winfrey-Carter to talk about the city's snow plowing strategy with Transportation Director John Daly. [Referral Action Date: 2/22/2020 @ Electronic City Council Meeting.]

210116 Discussion Item/Job Requirements/Salaries

A Discussion Item as requested by Councilperson Galloway to talk about job requirements and salaries for appointees. [Referral Action Date: 2/22/2020 @ Electronic City Council Meeting.]

210114 Discussion Item/Eighteen (18) Properties in the City of Flint Pilot Program

A Discussion Item as requested by Councilperson Mays to review the 18 properties City Council retained from the Genesee County Land Bank, including a history of the finances for Jefferson School. [Referral Action Date: 2/17/2020 @ Electronic Governmental Operations Committee Meeting.]

210100 Discussion Item/Multi-Member Bodies

A discussion item as requested by Councilperson Mays to discuss multi-member bodies. [Referral Action Date: 2/22/2021 @ City Council Electronic Public Meeting.]

210099 Discussion Item/Community Updates/City of Flint Web Site

A discussion item as requested by Councilperson Mays to discuss what constitutes a community update on the City of Flint's Web site. [Referral Action Date: 2/22/2021 @ City Council Electronic Public Meeting.]

ADJOURNMENT

RESOLUTION NO.: 210233.1

PRESENTED: JUN 14 2021

ADOPTED: _____

RESOLUTION APPROVING CITY OF FLINT BROWNFIELD REDEVELOPMENT AUTHORITY BROWNFIELD PLAN FOR THE JAMES P. COLE PROJECT
(1809 James P. Cole)

BY THE CITY ADMINISTRATOR:

On July 28, 1997, the Flint City Council adopted a resolution establishing the Brownfield Redevelopment Authority (Authority) of the City of Flint pursuant to the Brownfield Redevelopment Financing Act 381 of the Public Acts ("Act") of 1996, to promote the revitalization, redevelopment and reuse of certain blighted, tax reverted and functionally obsolete properties.

Under Act 381, the Authority is authorized to develop and propose for adoption by the City Council a brownfield plan for one (1) or more parcels of eligible properties.

Pursuant to the resolution establishing the Authority and the bylaws of the Authority, the Authority has submitted a proposed brownfield plan for 1809 James P. Cole (the Plan).

The required notice of the public hearing on the proposed Plan was given in accordance with section 13 of Act 381, and such hearing held by the City Council on March 8, 2021.

Once approved, the brownfield plan will allow of the reimbursement of eligible project expenses from the additional tax revenue realized as a result of the redevelopment. The reimbursement can occur over the life of the plan which is normally 30 years. The eligible reimbursable expenses are estimated at around $2,541,508.

IT IS RESOLVED, THAT:

1. Definitions. Where used in this Resolution, the terms set forth below shall have the following meaning unless the context clearly requires otherwise:

"Eligible Activities" or "eligible activity" shall have the meaning described in Act 381.
"Eligible Property" means the property designated in the Plan as the Eligible Property, as described in Act 381.
"Plan" means the Plan prepared by the Authority, as transmitted to the City Council by the Authority for approval, copies of which Plan are on file in the office of the City Clerk.
"Taxing Jurisdiction" shall mean each unit of government levying an ad valorem property tax on the Eligible Property.

2. Public Purpose. The City Council hereby determines that the Plan constitutes a public purpose.
3. Best Interest of the Public. The City Council hereby determines that it is in the best interest of the public to promote the revitalization of environmentally distressed areas in the City to proceed with the Plan.
4. Review Considerations. As required by act 381, including consideration of the criteria of "facility" as defined in act 381;
    a. Portions of the property designated in the Plan meet the definition of Eligible Property, as described in act 381, including consideration of the criteria of "facility" as defined in Act 381;
    b. The Plan meets the requirements set forth in section 13 of Act 381.

c. The proposed method of financing the costs of eligible activities is feasible and the authority has the ability to arrange the financing.
d. The costs of eligible activities proposed are reasonable and necessary to carry out the purpose of Act 381.
e. The amount of captured taxable value estimated to result from adoption of the Plan is reasonable.

5. Approval and Adoption of Plan. The Plan as submitted by the authority is hereby approved and adopted. A copy of the Plan and all amendments thereto shall be maintained on file in the City Clerk's office.
6. Establishment of Project Fund; Approval of Depositary. The Authority shall establish a separate fund for the Eligible Property subject to this Plan, which shall be kept in a depositary bank account or accounts in bank or banks approved by the Treasurer of the City. All monies received by the Authority pursuant to the Plan shall be deposited in the Project Fund for the Eligible Property. All monies in the Project Fund and earnings thereon shall be used only in accordance with the Plan and Act 381.
7. Use of Monies in the project Fund. The monies credited to the Project Fund and on hand therein from time to time shall be used annually to first make those payments authorized by and in accordance with the Plan and any development.
8. Payment of Tax Increment Revenues to Authority. The municipal and the county treasurers shall, as ad valorem and specific local taxes are collected on the Eligible Property, pay the Tax Increment Revenues to the Authority for deposit in the Project Fund. The payments shall be made not more than 20 days after the Tax Increment Revenues are collected.
9. Disclaimer. By adoption of this Resolution and approval of the Plan, the City assumes no obligation or liability to the owner, developer, lessee or lessor of the eligible property for any loss or damage that may result to such persons from the adoption of this Resolution and Plan. The City makes no guarantees or representation as to the determinations of the appropriate state officials regarding the ability of the Authority to capture tax increment revenues from the state and local school district taxes for the Plan.
10. Repealer. All of this resolution and parts of resolutions insofar as they conflict with the provisions of this resolution shall be rescinded.

Approved as to Form:

Angela Wheeler

Angela Wheeler
Chief Legal Officer

ADMINISTRATION:

Sheldon A. Neeley
Mayor

Kate Fields, Council President

CITY OF FLINT

RESOLUTION STAFF REVIEW FORM

TODAY'S DATE: *2/3/2021*

BID/PROPOSAL#

AGENDA ITEM TITLE: Brownfield Plan Approval

PREPARED BY Khalfani Stephens
(Please type name and Department)

VENDOR NAME:

BACKGROUND/SUMMARY OF PROPOSED ACTION:

This is a resolution to establish a brownfield plan for 1809 James P. Cole. The project is estimated to be approximately $14.25 Million and will result in approximately 110K SF of renovated industrial space and 190K of new industrial space. New job creation is TBD.

FINANCIAL IMPLICATIONS: This will reduce the taxes collected for up to 30 years (see attached table)

BUDGETED EXPENDITURE? YES ☐ **NO** ☒ **IF NO, PLEASE EXPLAIN:**

Dept.	Name of Account	Account Number	Grant Gode	Amount
		FY19/20 GRAND TOTAL		

PRE-ENCUMBERED? YES ☐ **NO** ☐ **REQUISITION NO:**

CITY OF FLINT

ACCOUNTING APPROVAL: _____ **Date:** _____

WILL YOUR DEPARTMENT NEED A CONTRACT? **YES** ☐ **NO** ☒
(If yes, please indicate how many years for the contract) YEARS

WHEN APPLICABLE, IF MORE THAN ONE (1) YEAR, PLEASE ESTIMATE TOTAL AMOUNT FOR EACH BUDGET YEAR: (*This will depend on the term of the bid proposal)*

BUDGET YEAR 1

BUDGET YEAR 2

BUDGET YEAR 3

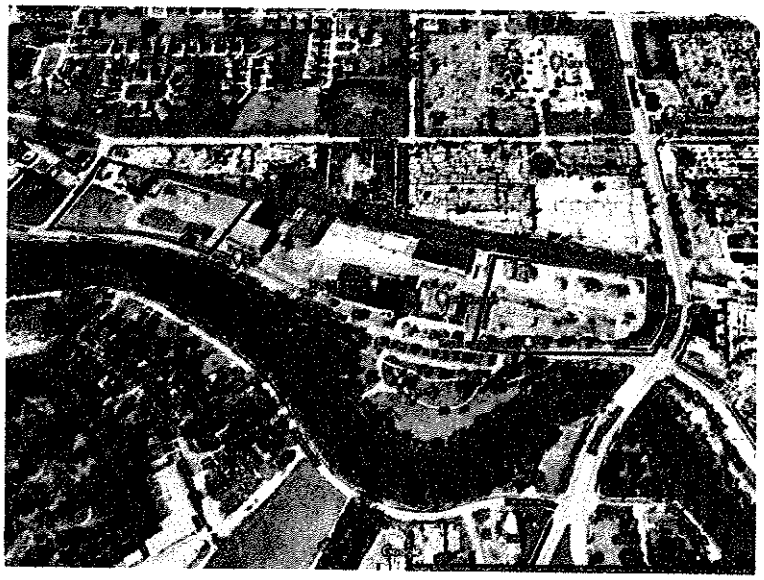
OTHER IMPLICATIONS (*i.e., collective bargaining*):

STAFF RECOMMENDATION: *(PLEASE SELECT):* ☒ **APPROVED** ☐ **NOT APPROVED**

DEPARTMENT HEAD SIGNATURE: __Khalfani Stephens, Economic Development Director
(PLEASE TYPE NAME, TITLE)

EXHIBIT A

CITY OF FLINT
BROWNFIELD REDEVELOPMENT AUTHORITY



BROWNFIELD PLAN FOR THE
PROPOSED DUPONT INDUSTRIAL FACILITY
REDEVELOPMENT PROJECT

Prepared for		Prepared By
DEARBORN CAPITAL James P Cole Venture, LLC Attn: Ms. Mona Navitsky c/o Dearborn Capital Partners, LLC 980 North Michigan, Suite 1620 Chicago, IL 60611 Attn: Mr. Brien Wloch; Managing Member M (312) 543-1250 E mona.navitsky@dearcapcre.com		ASSOCIATED ENVIRONMENTAL SERVICES, LLC Mr. Nicholas G. Maloof, RPG President and General Counsel Associated Environmental Services, LLC 40701 Woodward Avenue, Suite 50 Bloomfield Hills, MI 48304 T (248) 203-9898 M (248) 250-2525 E ngm@associatedenvironmental.net W www.associatedenvironmental.net

Plan Preparation Date: **October 31, 2020**

Approved by the Brownfield Redevelopment Authority on: _____

Approved by the Flint City Council on: _____

CITY OF FLINT
BROWNFIELD REDEVELOPMENT AUTHORITY
BROWNFIELD PLAN

TABLE OF CONTENTS

I. INTRODUCTION

In order to promote the revitalization of environmentally distressed and blighted areas within the boundaries of the City of Flint, Michigan (the "City"), the City has established the City of Flint Brownfield Redevelopment Authority (the "FBRA") pursuant to Michigan Public Act 381 of 1996, as amended ("Act 381").

The primary purpose of this Brownfield Plan ("Plan") is to promote the redevelopment of and private investment in certain "brownfield" properties within the City. Inclusion of property within this Plan will facilitate financing of environmental response and other Eligible Activities at eligible properties, and will also provide tax incentives to eligible taxpayers willing to invest in revitalization of eligible sites, commonly referred to as "brownfields." By facilitating redevelopment of brownfield properties, this Plan is intended to promote economic growth for the benefit of the residents of the City and all taxing units located within and benefited by the FBRA.

This Plan is intended to apply to the eligible property identified in this Plan and, if tax increment revenues are proposed to be captured from that eligible property, to identify and authorize the Eligible Activities to be funded by such tax increment revenues.

This Plan is intended to be a living document, which may be modified or amended in accordance with the requirements of Act 381, as necessary to achieve the purposes of Act 381. The applicable sections of Act 381 are noted throughout the Plan for reference purposes.

This Plan describes the project to be completed (see Attachment C) and contains information required by Section 13(2) of Act 381.

II. GENERAL PROVISIONS

A. Description of the Eligible Property (Section 13 (2)(h)) and the Project

The property comprising the eligible property consists of multiple parcel of land that are either contaminated and qualify as a "facility" as that term is defined in Part 201 of NREPA, as amended, are immediately adjacent to the "facility" and/or will be unified with the "facility" parcel(s). **Each parcel is eligible as it is either contaminated and qualifies as a "facility" and/or it is adjacent to and being combined with a parcel that is a "facility."**

The parcel and all tangible personal property located thereon will comprise the eligible property and is referred to herein as the "Property."

Attachment A includes a site map of the Property. The Property is located east of Industrial Avenue, south of East Hamilton Avenue, west of James P. Cole Boulevard, and north of East Wood Street. The Property contains one several existing structures. The Property was historically used for industrial activities/purposes since the early 1900's.

The existing structures and buildings have been mostly unoccupied for several years.

The eligible property will include all tangible personal property to be located on the real property. Parcel information is outlined below.

Address	1809 James P. Cole Boulevard, Flint, Genesee County, MI 48503
Parcel ID	Parcel ID Nos. 41-06-452--014 & 41-06-452-015
Owner	James P Cole Venture, LLC
Legal Description (obtained from ALTA Survey)	SEE ATTACHED ALTA Survey

James P Cole Venture, LLC is the project developer ("Developer") and owner of the Property.

The proposed Project is comprised of a build-to-suit redevelopment of a 17.99 acre historically industrial property currently containing approximately 110,578 square feet of existing structures. According to information provided to AES, the Property is proposed to be redeveloped into a multi-tenant multi-building industrial park. According to a Site Plan provided by Developer, approximately 110,578 square feet of existing building will remain and undergo renovations with the remaining buildings being demolished to make way for an additional 190,700 square feet of proposed new construction buildings, all on 17.99 acres of improved commercial and industrial land.

The completed development will include two single or multiple tenant structures each of which can be expanded to accommodate growth of an existing tenant or additional tenants within the proposed structures.

The Project will be undergoing site plan and zoning review by the City of Flint Engineering Department and Planning & Development Departments, and is therefore subject to change as part of the approval processes. The Project is currently estimated to be an estimated $14,250,000.00 (excluding land costs) investment by Developer plus any furniture, fixtures and equipment (FF&E) and other Personal Property of the proposed tenants (Operators).

It is currently anticipated, subject to necessary Planning, Engineering, FBRA and State of Michigan EGLE, MEDC/MSF, and Tax Commission approvals, that construction will begin in the Summer/Fall of 2021, or sooner, subject to approval of Eligible Activities, including retroactive approval of completed Eligible Activities. It is anticipated that the Eligible Activities will be completed within 12-18 months of the start date.

The project description provided herein is a summary of the proposed development at the time of the adoption of the Plan. The actual development may vary from the project description provided herein, without necessitating an amendment to this Plan, so long as such variations are not material and arise as a result of governmental processes, changes in market and/or financing conditions affecting the project and/or are related to the addition or immaterial removal of amenities to the project. All material changes, as determined by FBRA in its reasonable discretion, to the project description are subject to the approval of the FBRA staff and shall be consistent with the overall nature of the proposed development, its proposed public purpose, and the purposes of Act 381.

Census Tract Qualification
The Property is located in a low-income community (LIC) Census Tract (Census Tract No. 26049013600). A low-income community (LIC) Census Tract is defined as, "...a poverty rate of at least 20 percent or with median family incomes that do not exceed 80 percent of area median income..." In addition, the Property is located in a Qualified Opportunity Zone, which means that the area has been targeted by State and Local Governmental Units for development. *Please see the attached CDFI Fund Census Tract Map.*

Based on the information provided by Developer, the Property contains structures and infrastructure that will be demolished and/or partially demolished and removed as part of the planned re-development ("Project"). In addition, the proposed Project will redevelop an underutilized Property that contains multiple impediments to redevelopment. The proposed Project will create temporary construction jobs and is intended to create permanent jobs in an area of Genesee County (Flint) with a high unemployment rate as demonstrated by the Census Tract information.

Attachment C provides a description of the project to be completed at the Property (the "Project"). **Attachment C** also includes details regarding development team, total investment amount, description of project uses number of temporary and permanent jobs,

project renderings, and additional financing incentives (IFT). **Attachment D** includes letters of support for the Project.

B. Basis of Eligibility (Section 13 (2)(h) and Section 2 (o))

The Property qualifies as a "facility" as that term is defined under the natural Resources and Environmental Protection Act (NREPA), P.A.451 of 1994, as amended, based on the presence of soil contamination.

The Property is considered "eligible property" as defined by Act 381, Section 2 because (a) the Property was used for industrial purposes; (b) it is located within the City of Flint, a qualified local governmental unit under Act 381; and (c) the Property is determined to be a "facility[1]" as defined by Act 381.

The Property qualifies as a "facility" and is eligible for Brownfield Redevelopment Incentives pursuant to the Brownfield Redevelopment Financing Act, P.A. 381 of 1996, as amended. The Property is classified as a "facility" due to the presence of soil contamination related to historical use and operation of portions of the Property for industrial purposes.

In addition, based on the condition of the existing structures, the Property could also qualify under either "blighted[2]" or "functionally obsolete[3]" status, however, Developer has not moved forward with either or both such designations as the Property already qualifies under Act 381.

Phase I Environmental Site Assessment (ESA)

Applied Ecosystems, Inc. (AEI) was retained by Developer to prepare a Baseline Environmental Assessment (BEA) and published the BEA on September 20, 2016 as of pre-acquisition due diligence and disclosed to MDEQ on December 7, 2016.

According to information presented the BEA, the Property was historically used for industrial activities/purposes by E. I. du Pont de Nemours and Company (DuPont) and predecessor companies since the early 1900's beginning in 1901 with Flint varnish and Color Works providing paint and varnishes for the carriage industry and converting to automotive paint manufacturing in 1910. DuPont purchased the property in 1918 and operated on-site until 1995. In 1989, DuPont initiating environmental site investigation activities to assess soil and groundwater on the Property.

In 2003 DuPont entered into a Voluntary Corrective Action agreement with MDEQ and actions included:

- Excavation and disposal of contaminated soil;
- Groundwater treatment; and
- Free product removal.

In 2005, a Remedial Action Plan (RAP) was prepared that specified long term groundwater treatment as well as property use restrictions (Deed Restrictions).

In 2015, after 12 consecutive monthly gauging events with no free product present, DuPont submitted a request for a "No Further Action" determination related to free product removal activities

Contamination remaining on-site includes volatile organic compounds (VOCs), semi-VOCs (SVOCs), arsenic, chromium, cobalt and cyanide. Known impacted media include soil and groundwater with exceedances of the volatilization to indoor air (VIA) pathway likely based on the known concentrations of VOCs.

Please see Figures 1 and 2 for Site Location and Aerial Photo Maps.

Based on the documented concentrations of soil and groundwater contamination, concentrations exceed the EGLE Part 201 Generic Residential Cleanup Criteria (GRCC) promulgated under Part 201 of the Natural Resources and Environmental Protection Act (NREPA), 1994 P.A. 451, as amended (Part 201), and therefore the Property meets the definition of a "facility" as defined pursuant to Part 201.

As the Property qualifies as a "facility[1]," it is eligible for Brownfield Redevelopment Incentives pursuant to the Brownfield Redevelopment Financing Act, P.A. 381 of 1996, as amended. In addition, based on the condition of the existing structures, the Property could also qualify under either "blighted[2]" or "functionally obsolete[3]" status.

Sample results were compared to current Generic Residential Cleanup Criteria (GRCC) promulgated under Part 201 of the Natural Resources and Environmental Protection Act (NREPA), 1994 P.A. 451, as amended (Part 201). Based on the results of the Phase II ESA the Property meets the definition of a "facility" as defined pursuant to Part 201.

[1] Under Part 201 of NREPA. P.A. 451 of 1994, as amended, Section 20101(1)(s) states

"Facility" means any area, place, parcel or parcels of property, or portion of a parcel of property where a hazardous substance in excess of the concentrations that satisfy the cleanup criteria for unrestricted residential use has been released, deposited, disposed of, or otherwise comes to be located. Facility does not include any area, place, parcel or parcels of property, or portion of a parcel of property where any of the following conditions are satisfied:

(i) Response activities have been completed under this part or the comprehensive environmental response, compensation, and liability act, 42 USC 9601 to 9675, that satisfy the cleanup criteria for unrestricted residential use.
(ii) Corrective action has been completed under the resource conservation and recovery act, 42 USC 6901 to 6992k, part 111, or part 213 that satisfies the cleanup criteria for unrestricted residential use.
(iii) Site-specific criteria that have been approved by the department for application at the area, place, parcel of property, or portion of a parcel of property are met or satisfied and hazardous substances at the area, place, or property that are not addressed by site-specific criteria satisfy the cleanup criteria for unrestricted residential use.
(iv) Hazardous substances in concentrations above unrestricted residential cleanup criteria are present due only to the placement, storage, or use of beneficial use by-products or inert materials at the area, place, or property in compliance with part 115.
(v) The property has been lawfully split, subdivided, or divided from a facility and does not contain hazardous substances in excess of concentrations that satisfy the cleanup criteria for unrestricted residential use.
(vi) Natural attenuation or other natural processes have reduced concentrations of hazardous substances to levels at or below the cleanup criteria for unrestricted residential use.

SEE: http://www.legislature.mi.gov/(S(1xfrucyrrylw4dlqaeqpznk3))/mileg.aspx?page=getObject&objectName=mcl-324-20101

[2] Under MCL 125.2652(2)(e) "Blighted" means property that meets any of the following criteria as determined by the governing body:
(i) Has been declared a public nuisance in accordance with a local housing, building, plumbing, fire, or other related code or ordinance.
(ii) Is an attractive nuisance to children because of physical condition, use, or occupancy.
(iii) Is a fire hazard or is otherwise dangerous to the safety of persons or property.
(iv) Has had the utilities, plumbing, heating, or sewerage permanently disconnected, destroyed, removed, or rendered ineffective so that the property is unfit for its intended use.
(v) Is tax reverted property owned by a qualified local governmental unit, by a county, or by this state. The sale, lease, or transfer of tax reverted property by a qualified local governmental unit, county, or this state after the property's inclusion in a brownfield plan shall not result in the loss to the property of the status as blighted property for purposes of this act.
(vi) Is property owned or under the control of a land bank fast track authority, whether or not located within a qualified local governmental unit. Property included within a brownfield plan prior to the date it meets the requirements of this subdivision to be eligible property shall be considered to become eligible property as of the date the property is determined to have been or becomes qualified as, or is combined with, other eligible property. The sale, lease, or transfer of the property by a land bank fast track authority after the property's inclusion in a brownfield plan shall not result in the loss to the property of the status as blighted property for purposes of this act.
(vii) Has substantial subsurface demolition debris buried on site so that the property is unfit for its intended use.

[1]Under MCL 125.2652(2)(s) "Functionally obsolete" means that the property is unable to be used to adequately perform the function for which it was intended due to a substantial loss in value resulting from factors such as overcapacity, changes in technology, deficiencies or superadequacies in design, or other similar factors that affect the property itself or the property's relationship with other surrounding property.

C. Summary of Eligible Activities and Description of Costs (Section 13 (2)(a),(b))

The "Eligible Activities" that are intended to be carried out at the Property are considered "Eligible Activities" as defined by Sec 2 of Act 381, because they include, but are not limited to: (1) Phase I ESA, Phase II ESA and Baseline Environmental Assessment activities; (2) 7a Due Care Activities including Phase II ESA Due Care Investigation Activities and Preparation of pre-development and post-development Due Care Plans or Documentation of Due Care Compliance; (3) Additional Response Activities; (4) Building Demolition Activities including selective exterior and interior demolition and lead, asbestos and hazardous materials abatement; (5) Development and Preparation of Brownfield Plan and Act 381 Work Plan; (6) UST Removal Activities; (7) Remediation Activities including installation of engineering controls and operation & maintenance (O&M) related to the engineering controls; (8) Site Preparation Activities to ready the site for redevelopment including utility disconnection and re-connection, removal and re-location of public utilities, land balancing and rough and finished grading; (9) Infrastructure Activities including the construction of storm water retention/detention ponds and/or systems, and installation of new utilities; and (10) Public Improvements including installation of public utilities, street improvements, deceleration lanes and drive approaches, streetscapes, landscaping and other related activities. In addition, supplementary Eligible Activities that are financial in nature include: (1) Interest on the sums expended to implement the Eligible Activities at a rate of five (5%) per annum; and (2) environmental insurance may be obtained at some during the project development process.

A summary of the Eligible Activities and the estimated cost of each eligible activity intended to be paid for with Tax Increment Revenues from the Property are shown in the table attached hereto as **Attachment E.**

The Eligible Activities described in **Attachment E** are not exhaustive. Subject to the approval of FBRA staff in writing, additional Eligible Activities may be carried out at the Property, without requiring an amendment to this Plan, so long as such Eligible Activities are permitted by Act 381 and the performance of such Eligible Activities does not exceed the total costs stated in **Attachment E.**

Unless otherwise agreed to in writing by the FBRA, all Eligible Activities shall commence within eighteen (18) months after the date the governing body approves this Plan and be completed within three (3) years after approval of the Michigan Strategic Fund work plan, if applicable, or three (3) years after execution of the Reimbursement Agreement (as that term is defined below). Any long-term monitoring or operation and maintenance activities or obligations that may be required will be performed in compliance with the terms of this Plan and any documents prepared pursuant to this Plan.

The Developer desires to be reimbursed for the costs of Eligible Activities. Tax increment revenue generated by the Property will be captured by the FBRA and used to reimburse

the cost of the Eligible Activities completed on the Property pursuant to the terms of a Reimbursement Agreement to be executed by the FBRA and the Developer after approval of this Plan (the "Reimbursement Agreement"), to the extent permitted by Act 381. In the event this Plan contemplates the capture of tax increment revenue derived from "taxes levied for school operating purposes" (as defined by Section 2(oo) of Act 381 and hereinafter referred to as "School Taxes"), the Developer acknowledges and agrees that FBRA's obligation to reimburse the Developer for the cost of Eligible Activities with tax increment revenue derived from School Taxes, or Specific Taxes that are considered School Taxes, (as these capitalized terms are defined by Act 381) is contingent upon the Developer receiving at least the initial applicable work plan approvals by the Michigan Strategic Fund and/or the EGLE, as may be required pursuant to Act 381.

FBRA agrees to retroactively reimburse Developer for all Eligible Activities completed prior to the approval of this Plan and for Eligible Activities completed as described in this Plan from the Local Taxes, or Specific Taxes that are considered Local Taxes, at the percentage ratio that Local Taxes comprise the overall combined Local and School Taxes. To the extent that Developer obtains Act 381 Work Plan approval from EGLE or MEDC/MSF, then the remaining percentage of Eligible Activities will be reimbursed to Developer. If deemed necessary, Developer will provide the FBRA with evidence, reasonably satisfactory to FBRA, that the Developer has the financial means to complete the project without the capture of, and subsequent reimbursement with, the contemplated School Taxes.

This Plan provides for the capture of taxes levied for school purposes (School Tax Capture), comprised of the State Education Tax (SET) and School Operating Tax, from the eligible Property. However, as the approval of School Tax Capture is at the discretion of the EGLE and MEDC/MSF, all Eligible Activities shall be reimbursable from Local Taxes unless School Tax Capture is approved by the agency responsible for the Eligible Activity(ies), then reimbursement will be from a combination of both Local and School Taxes.

The estimated costs outlined in this Plan and listed in **Attachment E** may increase or decrease depending on the nature and extent of any unknown or unanticipated conditions on the Property. As long as the total costs, adjusted by the 15% factor, are not exceeded, the line item costs of the Eligible Activities outlined herein, in the attachments and/or in the Brownfield Plan, may be adjusted between the Eligible Activities after the date this Plan is approved without the need for any additional approval from City of Flint City Council or the City of Flint Brownfield Redevelopment Authority, to the extent those adjustments do not violate the terms of any EGLE or MEDC/MSF approved work plan, if any. If necessary, this Plan may also be amended to add or delete Eligible Activities and the estimated cost of each.

The costs listed in **Attachment E** are estimated costs and may increase or decrease depending on the nature and extent of environmental contamination and other unknown conditions encountered on the Property. The actual cost of those Eligible Activities encompassed by this Plan that will qualify for reimbursement from tax increment revenues

of the FBRA from the Property shall be governed by the terms of the Reimbursement Agreement. No costs of Eligible Activities will be qualified for reimbursement except to the extent permitted in accordance with the terms and conditions of the Reimbursement Agreement and Section 2 of Act 381. The Reimbursement Agreement and this Plan will dictate the total cost of Eligible Activities subject to payment or reimbursement, provided that the total cost of Eligible Activities subject to payment or reimbursement under the Reimbursement Agreement shall not exceed the estimated costs set forth in **Attachment E**. As long as the total costs, adjusted by the 15% contingency under Act 381, are not exceeded, line item costs of Eligible Activities may be adjusted after the date this Plan is approved by the governing body (Flint City Council), to the extent the adjustments do not violate the terms of the approved EGLE or MSF work plan.

D. Estimate of Captured Taxable Value and Tax Increment Revenues (Section 13(2)(c)); Beginning Date of Capture of Tax Increment Revenues (Section (13)(2)(f); Impact of Tax Increment Financing on Taxing Jurisdictions (Section 13(2)(g))

This Plan anticipates the capture of tax increment revenues to reimburse the Developer for the costs of Eligible Activities under this Plan in accordance with the Reimbursement Agreement. A table of estimated tax increment revenues to be captured is attached to this Plan as **Attachment F**.

Tax increments are projected to be captured and applied to (i) reimbursement of eligible activity costs and payment of FBRA administrative and operating expenses, (ii) make deposits into the State Brownfield Redevelopment Fund, and (iii) make deposits into the FBRA's Local Brownfield Revolving Fund, as follows:

Section D Capture Summary Table[1]			
	Developer P&I	**Local RLF**	**State Brownfield RLF**
School Capture			
State Education Tax (SET)	$222,116.24	$81,770.29	$303,887
School Operating Tax	$1,428,867	$490,622	
Local Capture			
County Operating	$404,311	$148,844	
Library	$296,155	$109,027	
Flint Operating	$555,291	$204,426	
Public Safety	$444,232	$163,541	
Misc. Levies	$670,747	$246,930	
Genesee County Parks	$55,366	$20,383	
Parks and Rec	$37,019	$13,628	
Genesee ISD	$277,327	$102,096	
Mass Transit	$90,483	$33,310	
Flint Sinking Fund	$87,366	$32,163	
CS Mott Operating	$145,893	$53,709	
TOTAL	$4,715,173	$1,700,449	$303,887

In addition, the following taxes are projected to be generated but shall not be captured during the life of this Plan:		
Non-Capturable Millages		
Flint School Debt	$208,789	$76,864
CS Mott Debt	$58,491	$21,533
Public Library Debt	$134,751	$49,607
TOTAL	$402,030	$148,004

[1] All numbers presented are based on gross taxes generated in the Capture side of the TIR Capture Tables and may differ from the actual reimbursement amounts from each millage levy due to allocation percentages and rounding of numbers.

In no event shall the duration of this Plan exceed thirty-five (35) years following the date of the governing body's resolution approving this Plan, nor shall the duration of the tax capture exceed the lesser of the period authorized under subsection (3) and (5) of Section 13 of Act 381 or 30 years. Further, in no event shall the beginning date of the capture of tax increment revenues be later than five (5) years after the date of the governing body's resolution approving this Plan.

E. Plan of Financing (Section 13(2)(d)); Maximum Amount of Indebtedness (Section 13(2)(e))

The Eligible Activities are to be financed solely by the Developer. The FBRA will reimburse the Developer for the cost of approved Eligible Activities, but only from tax increment revenues generated from the Property. No advances have been or shall be made by the City or the FBRA for the costs of Eligible Activities under this Plan.

All reimbursements authorized under this Plan shall be governed by the Reimbursement Agreement. The inclusion of Eligible Activities and estimates of costs to be reimbursed in this Plan are intended to authorize the FBRA to fund such reimbursements and does not obligate the FBRA or the City to fund any reimbursement or to enter into the Reimbursement Agreement providing for the reimbursement of any costs for which tax increment revenues may be captured under this Plan, or which are permitted to be reimbursed under this Plan in the absence of tax increment revenues being generated from the Property. The amount and source of any tax increment revenues that will be used for purposes authorized by this Plan, and the terms and conditions for such use and upon any reimbursement of the expenses permitted by this Plan, will be provided solely under the Reimbursement Agreement contemplated by this Plan.

Unless otherwise agreed upon by the Developer, the FBRA, and the State of Michigan, the FBRA shall not incur any note or bonded indebtedness to finance the purposes of this Plan.

Interest shall be paid under this Plan as provided in the Reimbursement Agreement, provided that to the extent that the Michigan Strategic Fund or Michigan Department of Environment, Great Lakes and Energy (EGLE) does not approve the payment of interest on an eligible activity with School Taxes, interest shall not accrue or be paid under this Plan with respect to the cost of such Eligible Activity from School Taxes. Unless otherwise agreed upon by the Developer, the FBRA, and the State of Michigan, the FBRA will approve interest on the local portion of the reimbursement to the extent that the projected internal rate of return to the Developer does not exceed twenty (20%), as more specifically stated in the Reimbursement Agreement.

Reimbursements under the Reimbursement Agreement shall not exceed the cost of Eligible Activities permitted under this Plan, plus the 15% contingency factor and approved interest.

F. Duration of Plan (Section 13(2)(f))

Subject to Section 13b(16) of Act 381, the beginning date of capture of tax increment revenues for each eligible property shall occur in accordance with the TIF table described in **Exhibit F**. As the tax increment revenue table is an estimate/projection based on certain assumptions, the repayment period may exceed that depicted in the table. In no event, however, shall this Plan extend beyond the maximum term allowed by Section 13(2)(f) of Act 381 for the duration of this Plan.

Furthermore, this Plan, or any subsequent amendment thereto, may be abolished or terminated in accordance with Section 14(8) of Act 381 in the event of any of the following:

a. The governing body may abolish this Plan (or any subsequent amendment thereto) when it finds that the purposes for which this Plan was established have been accomplished.

b. The governing body may terminate this Plan (or any subsequent amendment thereto) if the project for which Eligible Activities were identified in this Plan (or any subsequent amendment thereto) fails to occur with respect to the eligible property for at least five (5) years following the date of the governing body resolution approving this Plan (or any subsequent amendment thereto), provided that the governing body first does both of the following:

(i) gives 30 days' written notice to the Developer at its last known address by certified mail or other method that documents proof of delivery attempted; and

(ii) provides the Developer with an opportunity to be heard at a public meeting.

Notwithstanding anything in this subsection to the contrary, this Plan (or any subsequent amendment thereto) shall not be abolished or terminated until the principal and interest on bonds, if any, issued under Section 17 of Act 381 and all other obligations to which the tax increment revenues are pledged have been paid or funds sufficient to make the payment have been identified or segregated.

G. Effective Date of Inclusion in Brownfield Plan

The Property will become a part of this Plan on the date this Plan is approved by the governing body (City Council).

H. Displacement/Relocation of Individuals on Eligible Property (Section 13(2)(i-l))

There are no persons or businesses residing on the eligible property and no occupied residences will be acquired or cleared, therefore there will be no displacement or relocation of persons or businesses under this Plan.

I. Local Brownfield Revolving Fund ("LBRF") (Section 8; Section 13(2)(m))

The FBRA has established a Local Brownfield Revolving Fund (LBRF). The LBRF will consist of all tax increment revenues authorized to be captured and deposited in the LSRRF, as specified in Section 13(5) of Act 381, under this Plan and any other plan of the FBRA. It may also include funds appropriated or otherwise made available from public or private sources.

The amount of tax increment revenue authorized for capture and deposit in the LBRF is estimated as depicted in the 30 Year Cash Flow Projection Table present in **Attachment F**. All funds, if any, deposited in the LBRF shall be used in accordance with Section 8 of Act 381.

J. Brownfield Redevelopment Fund (Section 8a; Section 13(2)(m))

The FBRA shall pay to the Department of Treasury at least once annually an amount equal to 3 mills of the taxes levied under the state education tax, 1993 PA 331, MCL 211.901 to 211.906, that are captured under this Plan for up to the first twenty-five (25) years of the duration of capture of tax increment revenues for each eligible property included in this Plan. If the FBRA pays an amount equal to 3 mills of the taxes levied under the state education tax, 1993 PA 331, MCL 211.901 to 211.906, on a parcel of eligible property to the Department of Treasury under Section 13b(14) of Act 381, the percentage of local taxes levied on that parcel and used to reimburse Eligible Activities for the Project under this Plan shall not exceed the percentage of local taxes levied on that parcel that would have been used to reimburse Eligible Activities for the Project under this Plan if the 3 mills of the taxes levied under the state education tax, 1993 PA 331, MCL 211.901 to 211.906, on that parcel were not paid to the Department of Treasury under Section 13b(14) of Act 381.

K. Developer's Obligations, Representations and Warrants

The Developer and its affiliates shall comply with all applicable laws, ordinances, executive orders, or other regulations imposed by the City or any other properly constituted governmental authority with respect to the Property and shall use the Property in accordance with this Plan.

The Developer, at its sole cost and expense, shall be solely responsible for and shall fully comply with all applicable federal, state, and local relocation requirements in implementing this Plan, if any.

The Developer represents and warrants that a Phase I Environmental Site Assessment ("ESA"), and if appropriate, a Phase II ESA, Baseline Environmental Assessment, and Due Care Plan or Response Activity Plan, pursuant to Part 201 of Michigan's Natural Resources and Environmental Protection Act (MCL 324.20101 *et seq.*), have been performed on the Property ("Environmental Documents"). Attached hereto as **Attachment G** is the City of Flint's Department of Buildings, Safety Engineering and Environmental acknowledgement of its receipt of the Phase I ESA, Phase II ESA and Baseline Environmental Assessment (BEA).

The Developer intends to include a City of Flint Land Bank Authority, Genesee County Land Bank Authority or State of Michigan Land Bank financing component, to be determined at a later date, depending upon the needs of the Project.

Except as otherwise agreed to by the FBRA, any material breach of a material representation or warranty contained in this Plan shall render the Plan invalid, subject to the Developer's reasonable opportunity to investigate and cure as described in the Reimbursement Agreement. Prior to any such invalidity, FBRA shall provide Developer written notice of the Developer's alleged breach and the opportunity to either refute the allegation or cure the breach within a reasonable period of time. Notwithstanding the foregoing, any irregularity may be waived by the FBRA, Flint City Council, MEDC/MSF or EGLE.

With the approval of this Brownfield Plan, it is the specific intention of the FBRA to authorize and support: (1) the preparation and submittal of an Act 381 Work Plan for approval by EGLE and MEDC/MSF, (2) application for an IFT Abatement under P.A. 198 of 1974, as amended; (3) grant or loan and other available incentives, including EGLE grants and loans, USEPA grants and loans, Genesee County grants and loans, and (3) other possible sources of incentives related to the Eligible Investments made by Developer as part of this project. It is understood that any such tax abatement may extend the currently depicted repayment period and that any such grant award may off-set the need for TIR reimbursement under the Plan or any such loan may use the TIR to repay a loan.

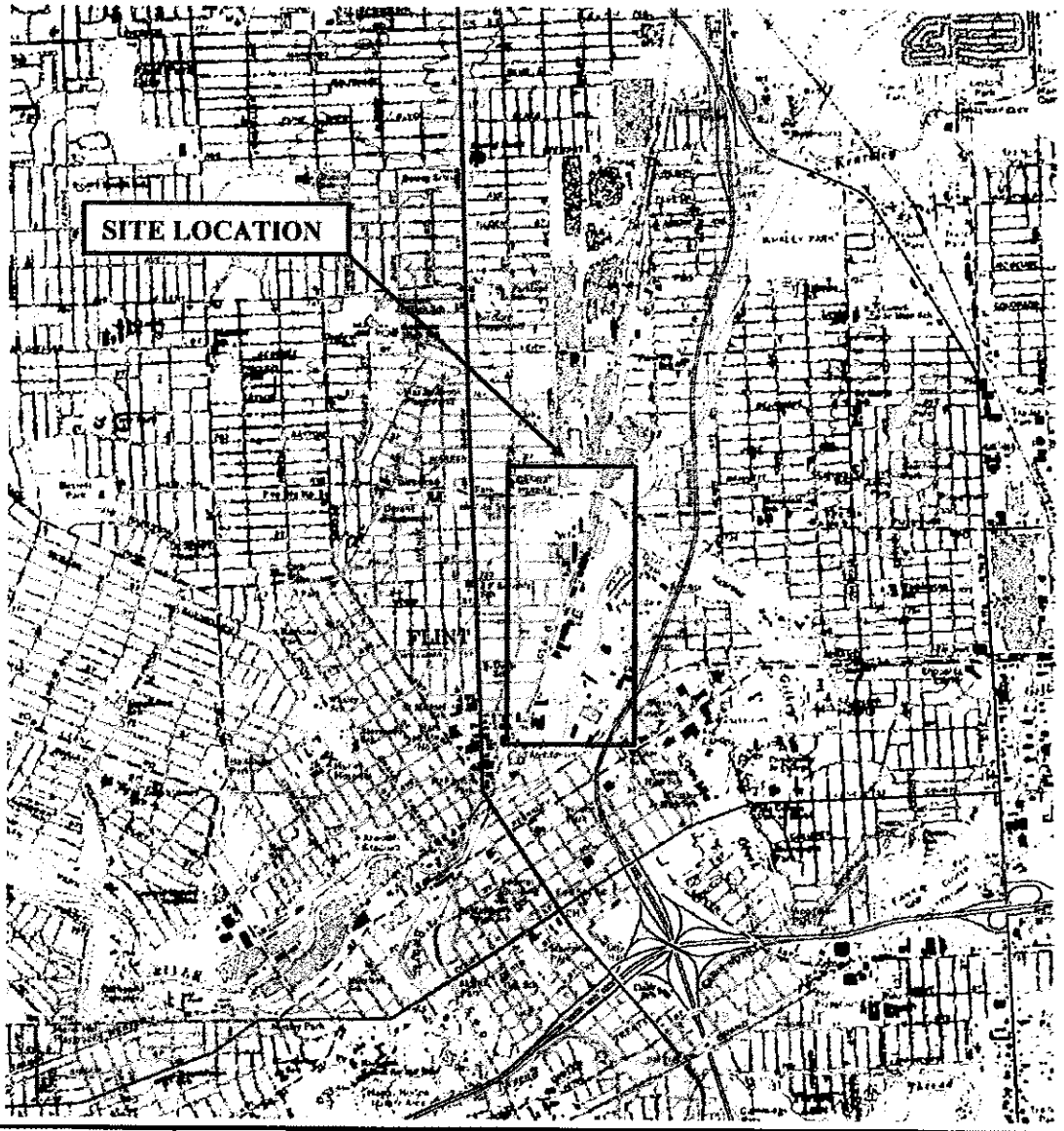
It should be noted that as part of the long term lease arrangement between Developer and Tenant, all proceeds from the Brownfield Plan TIR capture may be assigned to and accrue to the benefit of an entity to be identified in the Reimbursement Agreement which shall be deemed to be the Qualified Taxpayer under the Plan.

#3708938 v9

III. ATTACHMENTS

ATTACHMENT A

Site Map



REFERENCE
USGS 7.5 MIN TOPOGRAPHIC QUADRANGLE
FLINT NORTH, MICHIGAN
DATED: 1983
SCALE: 1: 24000

N

FIGURE 1: SITE LOCATION MAP

Former DuPont Industrial Facility

James P. Cole Boulevard
Flint, Genesee County, Michigan 48503

PROJECT: 20200416O1.01

DATE: 8/28/2020

PREPARED BY: NGM

ASSOCIATED ENVIRONMENTAL SERVICES, INC.
Environmental Services • Land Development • Real Estate Consulting
40701 Woodward Avenue, Suite 50
Bloomfield Hills, Michigan 48304
Tel (248) 203-9898 Fax (248) 647-0526
Email: info@associatedenvironmental.net
Web: www.associatedenvironmental.net

FIGURE 2: AERIAL SITE MAP

Former DuPont Industrial Facility

James P. Cole Boulevard
Flint, Genesee County, Michigan 48503

PROJECT: 2020041601.01
DATE: 8/28/20
PREPARED BY: NGM

ASSOCIATED ENVIRONMENTAL SERVICES, INC.
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E: info@associatedenvironmental.net
W: www.associatedenvironmental.net

ATTACHMENT B

Legal Descriptions of Eligible Property to which the Plan Applies

LEGAL DESCRIPTION - PER TITLE COMMITMENT NO. [illegible], EFFECTIVE DATE MAY 17, 2016, BY CIT Michigan Title Services

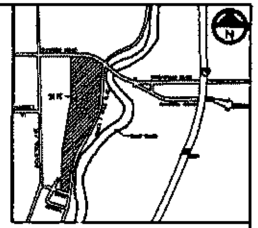
PARCEL A

[illegible]

LEGAL DESCRIPTION - PER TITLE COMMITMENT NO. [illegible], EFFECTIVE DATE MAY 17, 2016, BY CIT Michigan Title Services

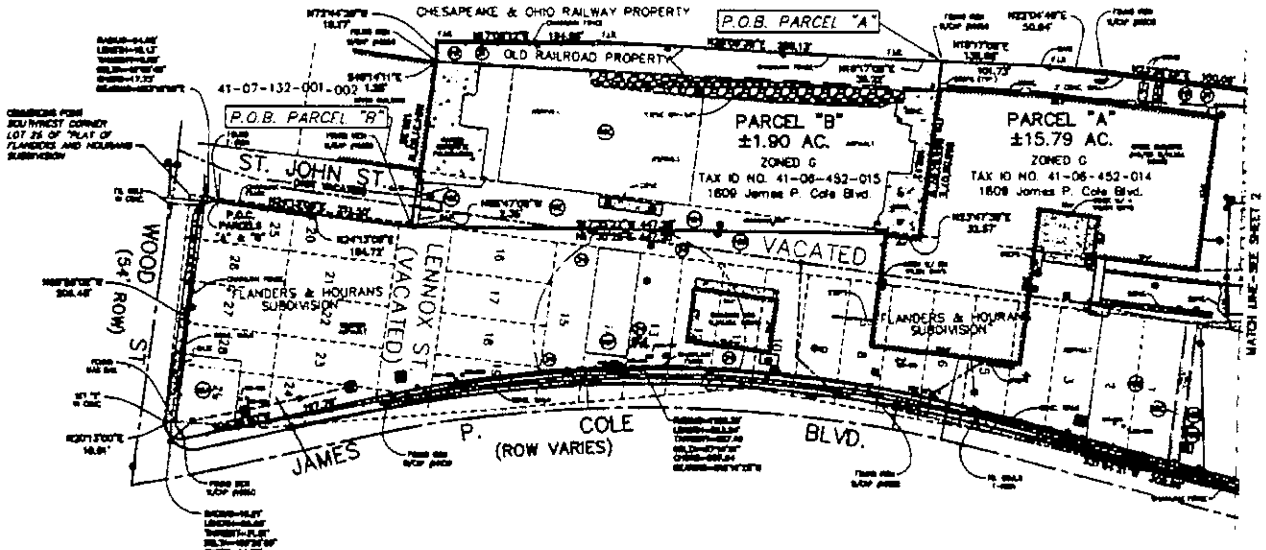
PARCEL B

[illegible]



SCHEDULE B - SECTION II - PER TITLE COMMITMENT NO. [illegible], EFFECTIVE DATE MAY 17, 2016, BY CIT Michigan Title Services

[illegible]



LEGEND

SURVEYOR NOTES:

[illegible]

SURVEYOR'S CERTIFICATE:

To: CIT Michigan Title Services, JAMES P COLE VENTURE, LLC., a Michigan Limited Liability Company, and CHEMICAL BANK. This is to certify that this map or plat and the survey on which it is based were made in accordance with the 2016 "Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys," jointly established and adopted by ALTA, NSPS, and includes items 3, 4, 7(a), 7(b), 8, 9, 10, 11 and 18 of Table A thereof. The field work was completed on 12-6-2012.

GREG R. [illegible] — 7/19/2016 (Date)

Michigan Professional Surveyor No. 46878

ZONING INFORMATION:

[illegible]

BASIS OF BEARING:

[illegible]

FLOOD PLAIN NOTE:

[illegible]

BEFORE YOU DIG CALL MISS DIG 1-800-482-7171 (TOLL FREE)

NOTE:

[illegible]

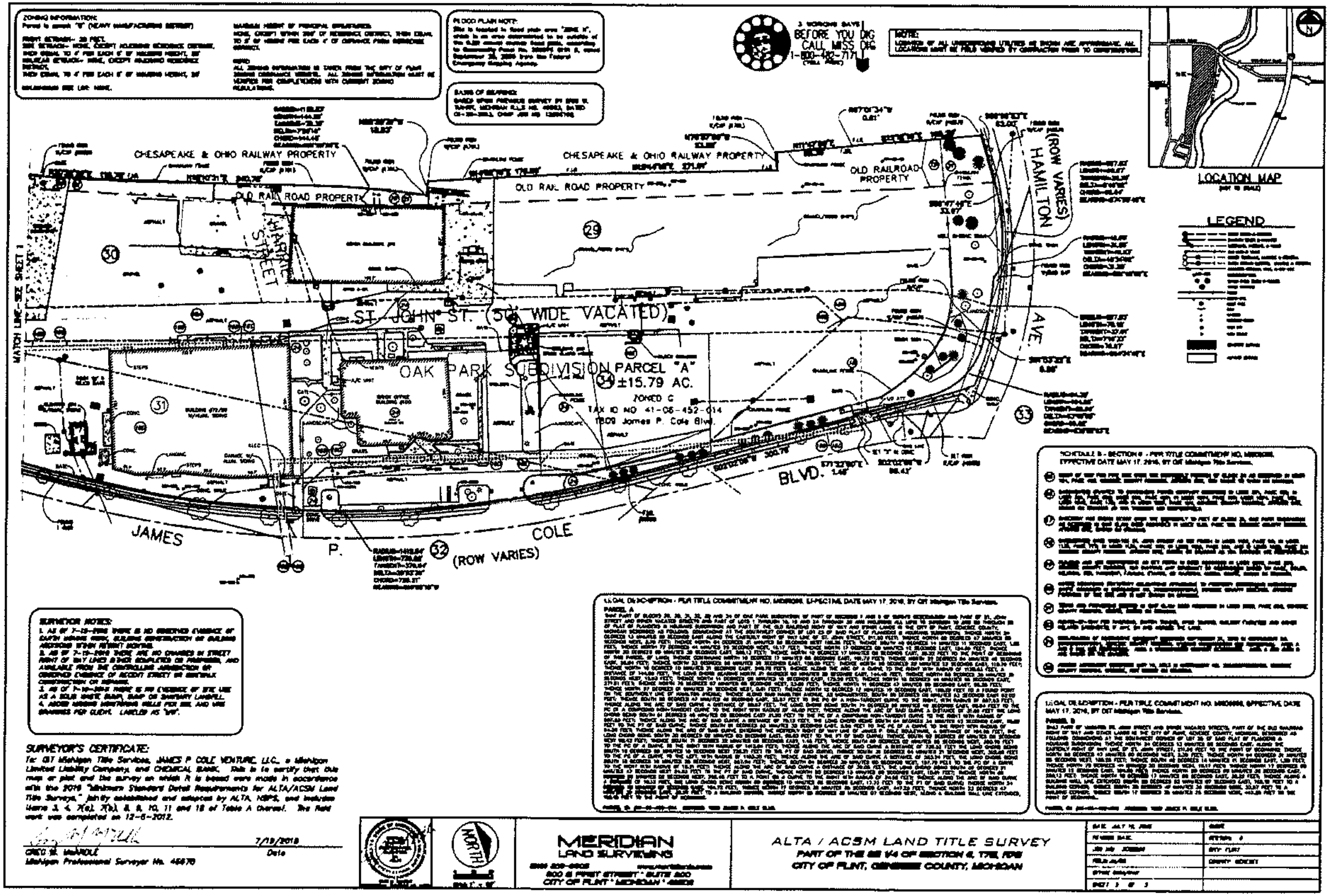
MERIDIAN LAND SURVEYING

CITY OF FLINT * MICHIGAN * 48502

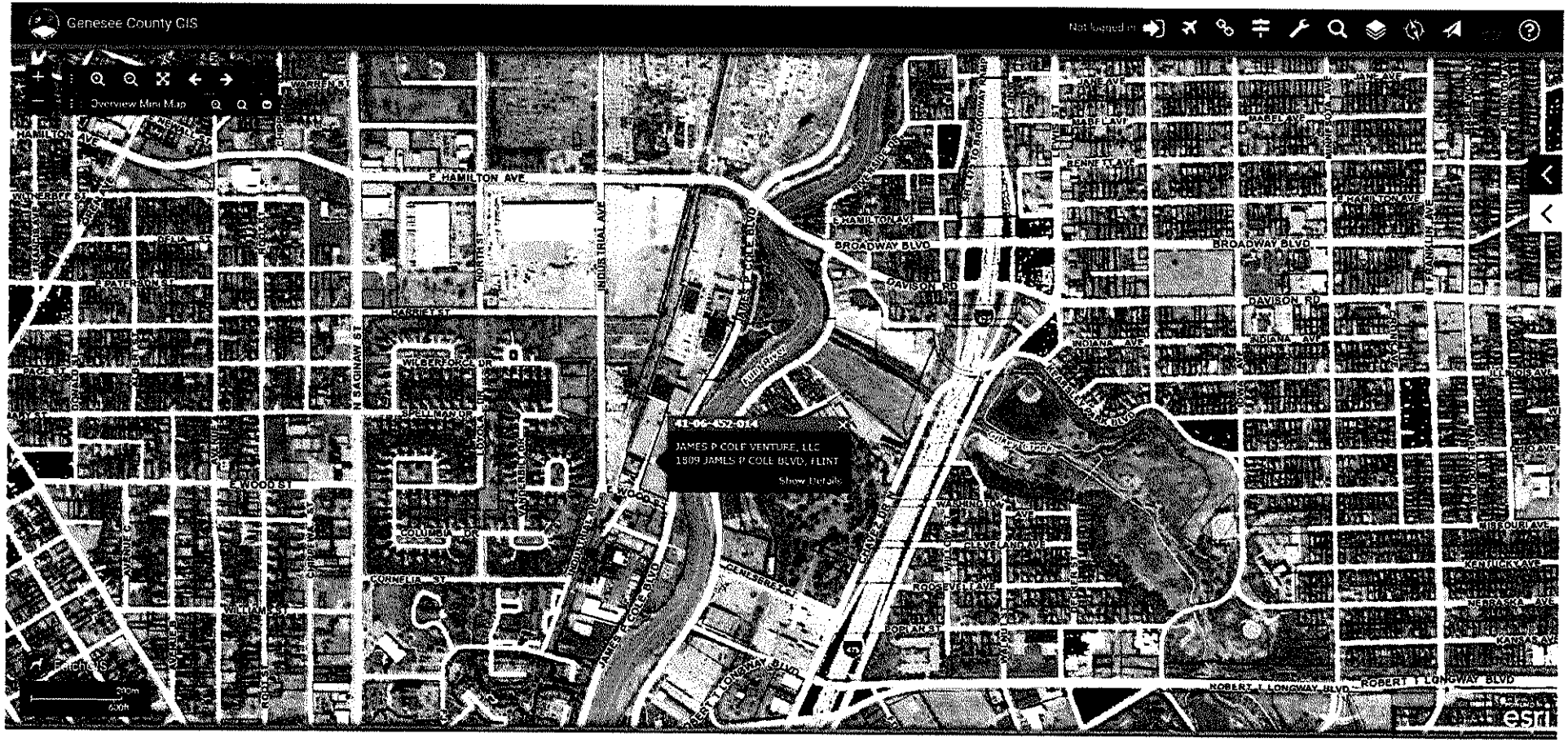
ALTA / ACSM LAND TITLE SURVEY

PART OF THE SE 1/4 OF SECTION 6, T7N, R7E

CITY OF FLINT, GENESEE COUNTY, MICHIGAN



BEFORE YOU DIG
CALL MISS DIG
CHESAPEAKE & OHIO RAILWAY PROPERTY
OLD RAIL ROAD PROPERTY
OLD RAILROAD PROPERTY
HARRIS STREET
ST. JOHN ST. (50' WIDE VACATED)
OAK PARK SUBDIVISION
PARCEL "A"
±15.79 AC.
ZONED C
TAX ID NO 41-05-452-014
1809 James P. Cole Blvd.
HAMILTON (ROW VARIES)
AVE.
JAMES P. COLE BLVD.
(ROW VARIES)
LOCATION MAP
LEGEND
MATCH LINE-SEE SHEET 1
SURVEYOR NOTES:
SURVEYOR'S CERTIFICATE:
7/19/2018
Date
Michigan Professional Surveyor No. 46670
MERIDIAN
LAND SURVEYING
NORTH
ALTA / ACSM LAND TITLE SURVEY
CITY OF FLINT, GENESEE COUNTY, MICHIGAN


Genesee County GIS
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Overview Mini Map
E HAMILTON AVE
BROADWAY BLVD
DAVISON RD
E WOOD ST
ROBERT T LONGWAY BLVD
JAMES P COLE VENTURE, LLC
1509 JAMES P COLE BLVD, FLINT
Show Details
esri


Genesee County GIS
Not logged in
Overview Mini Map
F HAMILTON AVE
BROADWAY BLVD
DAVISON RD
INDIANA AVE
E WOOD ST
CONNELLIA ST
ROBERT T LONGWAY BLVD
JAMES P COLE VENTURE, LLC
JAMES P COLE BLVD, FLINT
Show Details
esri


Genesee County GIS
Not logged in
Overview Mini Map
41-07-132-001
PIONEER LEASING, INC
1513 ST JOHN ST, FLINT
Show Details
E HAMILTON AVE
BROADWAY BLVD
DAVISON RD
N SAGINAW ST
INDUSTRIAL AVE
NORTH ST
HARRIET ST
WILBERFORCE DR
SPELLMAN DR
VANDERBILT DR
COLUMBIA DR
CORNELIA ST
E WOOD ST
JAMES P COLE BLVD
ROBERT T LONGWAY BLVD
KEARSLEY PARK BLVD
INDIANA AVE
ILLINOIS AVE
MISSOURI AVE
KENTUCKY AVE
NEBRASKA AVE
KANSAS AVE
WASHINGTON AVE
CLEVELAND AVE
ROOSEVELT AVE
POPLAR ST
GENESEE ST
N FRANKLIN AVE
JANE AVE
MABEL AVE
E PATERSON ST
PAGE ST
WARREN ST
HAMILTON AVE
Flint River
200m
esri


Genesee County GIS
Not logged in
Overview Mini Map
E HAMILTON AVE
BROADWAY BLVD
DAVISON RD
PIONEER LEASING, INC
ST JOHN ST, FLINT
Show Details
41-07-332-002
ROBERT T LONGWAY BLVD
esri

ATTACHMENT C

Project Description – See attached Project Description

Project Summary

Type of Use:	Industrial
Square Footage:	Approximately 110,578 square feet of existing building will remain and undergo renovations with the remaining buildings being demolished to make way for an additional 190,700 square feet of proposed new construction buildings, all on 17.99 acres of improved commercial and industrial land
Number of Housing Units:	Not Applicable
Total Investment:	$14,250,000.00 (excluding land costs) by Developer, plus additional investments for Furniture, Fixtures and Equipment (FF&E) will be made by individual Tenants
Additional Incentives:	In addition to Brownfield TIF, Developer is seeking tax abatements, Grants and Loans
Estimated Jobs – Construction:	67.5 FTE Jobs over 10 month estimated construction period
Estimated Jobs – Permanent:	TBD based on tenants recruited for occupancy
Project Timeline:	Developer intends to start redevelopment activities after final approval of all incentives

Attachment C

Brownfield Plan for James P Cole Venture, LLC

Provide a description of the project to be completed at the Property (the "Project")	*Include details regarding development team, total investment amount, description of project use, number of temporary and permanent jobs, and additional financing incentives (IFT). See attached for Project renderings.*
Project Description	The proposed redevelopment site is the former DuPont Industrial Facility located at 1809 James P. Cole Boulevard in Flint, Genesee County, Michigan 48503 (the "Property"). The Property is a currently proposed to be redeveloped into a multi-tenant multi-building industrial park. According to a site plan provided by Client, approximately 110,578 square feet of existing building will remain and undergo renovations with the remaining buildings being demolished to make way for an additional 190,700 square feet of proposed new construction buildings, all on 17.99 acres of improved commercial and industrial land (the "Project"). The existing structures and buildings have been mostly unoccupied for several years. According to a Site Plan provided by Developer, approximately 110,578 square feet of existing building will remain and undergo renovations with the remaining buildings being demolished to make way for an additional 190,700 square feet of proposed new construction buildings, all on 17.99 acres of improved commercial and industrial land. The completed development will include two single or multiple tenant structures each of which can be expanded to accommodate growth of an existing tenant or additional tenants within the proposed structures. The Project will be undergoing site plan and zoning review by the City of Flint Engineering Department and Planning & Development Departments, and is therefore subject to change as part of the approval processes. The Project is currently estimated to be an estimated $14,250,000.00 (excluding land costs) investment by Developer plus any furniture, fixtures and equipment (FF&E) and other Personal Property of the proposed tenants (Operators). Developer does not currently employ any employees at the Property as there are no existing operations. The development of the Project on the Property is comprised of two proposed new buildings (Building #1 and Building #2). The completion of this Project is estimated to create an average of 33.8 Full Time Equivalent (FTE) construction jobs per year during the nine (9) month estimated construction phase (.8 year) for each of the buildings comprising the Project within the City of Flint, Genesee County, Michigan resulting in an estimated total of 67.5 FTE jobs with an annualized construction payroll of $4,375,800.00 or more per year for the construction phase (estimated $3,281,850.00 or more per Building for a total Project construction payroll of $6,563,700.00 using FTE calculations).

As the proposed tenants for the new buildings have not been identified at this time, the actual estimated new full-time jobs being created by the Project are not yet determined. However, using U.S. Energy Information Administration (USEIA), Office of Energy Consumption and Efficiency Statistics, job creation can be estimated based on the proposed building square footage and national ratios for jobs on a per square foot basis. As the two new industrial buildings are proposed to be 90,000 ft2 and 100,000 ft2 and based on an the USEIA data of "Median square feet per worker" of 1,442 ft2, the estimated new jobs per building to be created are 62.4 and 69.3, respectively.

See: https://www.eia.gov/consumption/commercial/data/2012/bc/cfm/b2.php

According to Payscale.com, the "Average Production Worker Hourly Pay in Flint, Michigan is $13.24."

See:
https://www.payscale.com/research/US/Job=Production_Worker/Hourly_Rate/32d28c9e/Flint-MI

Based on the foregoing projections, the estimated new permanent FTE jobs payroll being created by the Project is 62.4 FTE X $13.24/Hour for 40 hours per week for 52 weeks/year = $1,718,812.76 and 69.3 FTE X $13.24/Hour for 40 hours per week for 52 weeks/year = $1,909,791.96 or a total estimated payroll of **$3,628,604.72**.

Development Team

Developer/Entity
James P Cole Venture, LLC
Attn: Ms. Mona Navitsky
c/o Dearborn Capital Partners, LLC
980 North Michigan, Suite 1620
Chicago, IL 60611
Attn: Mr. Brien Woch; Managing Member
M: (312) 543-1250
E: mona.navitsky@dearcapcre.com

Entity Members
Please see the attached Ownership Description

Brownfield Redevelopment Consultant and Primary Point of Contact
Mr. Nicholas G. Maloof, RPG
President and General Counsel
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E ngm@associatedenvironmental.net
W www.associatedenvironmental.net

Primary Environmental Consultant for Developer
To Be Determined (TBD)
T (___) ___-____
M (___) ___-____
E _____
W www._____

Status of the site planning/permitting process	The Project will be undergoing site plan and zoning review by the City of Flint Engineering Department and Planning & Development Departments, and is therefore subject to change as part of the approval processes. The Project is currently estimated to be an estimated $14,250,000.00 (excluding land costs) investment by Developer plus any furniture, fixtures and equipment (FF&E) and other Personal Property of the proposed tenants (Operators).
Other Incentives	In addition to Brownfield TIF, Developer intends to apply for Grants, Loans and Job Training incentives. Tennant(s)/Occupant(s) intend to apply for an Industrial Facilities Tax Abatement under the Plant Rehabilitation and Industrial Development Districts Act, P.A. 198 of 1974, as amended for a 12 year period.

See attached for Project drawings and renderings.

Job Creation and Economic Development

completion of this Project is estimated to create an average of 33.8 Full Time Equivalent (FTE) construction jobs per year during the nine (9) month estimated construction phase (.8 year) for each of the buildings comprising the Project within the City of Flint, Genesee County, Michigan resulting in an estimated annualized construction payroll of $4,375,800.00 or more per year for the construction phase (estimated $3,281,850.00 or more per Building for a total Project construction payroll of $6,563,700.00 using FTE calculations). As the proposed tenants for the Project are unknown, AES projected the estimated number of jobs using U.S. Energy Information Administration (USEIA), Office of Energy Consumption and Efficiency Statistics, job creation can be estimated based on the proposed building square footage and national ratios for jobs on a per square foot basis. AES also obtained and used information on hourly wages from Payscale.com. According to Payscale.com, the "Average Production Worker Hourly Pay in Flint, Michigan is $13.24. As the two new industrial buildings are proposed to be 90,000 ft2 and 100,000 ft2 and based on an the USEIA data of "Median square feet per worker" of 1,442 ft2, the estimated new jobs per building to be created are 62.4 FTE and 69.3 FTE, respectively. Based on the foregoing projections, the estimated new permanent FTE jobs payroll being created by the Project is 62.4 FTE X $13.24/Hour for 40 hours per week for 52 weeks/year = $1,718,812.76 and 69.3 FTE X $13.24/Hour for 40 hours per week for 52 weeks/year = $1,909,791.96 or a total estimated payroll of $3,628,604.72. Please see the tables below for a

Table 1: Construction Phase Job Creation and Direct Economic Impact

Phase of Construction	Job Classification	Typical Hourly Rate	Typical Hours Worked (Weekly)	Typical Annual Salary	Number of Jobs Related to Project (Average per year)	Total Annualized Payroll Related to Project	Duration of Jobs in Years Created by Project (in years based on # months construction)	Full-time Equivalent (FTE) Jobs	Total Project Related Payroll (salary/wages & benefits only)
Building #1: Site Preparation & Vertical Construction	Construction Tradesmen and affiliated workers	$46.75	40	$97,240.00	45	$4,375,800.00	0.8	33.8	$3,281,850.00
Building #2: Site Preparation & Vertical Construction	Construction Tradesmen and affiliated workers	$46.75	40	$97,240.00	45	$4,375,800.00	0.8	33.8	$3,281,850.00
Construction Phases Total					**90**	**$8,751,600.00**	**0.8**	**67.5**	**$6,563,700.00**

Average Hourly =	$46.75
Average Weekly =	$1,870.00
Average Annual =	$97,240.00
Total Annualized Payroll =	$4,375,800.00

Phase	Duration (Months)	Duration as Fraction of Year
Site Preparation	1.0	0.1
Vertical Const.	8.0	0.7
Total	**9.0**	**0.8**

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Table 2: Post Construction Phase / Permanent Job Creation and Direct Economic Impact

Phase of Operation	Job Classification	Typical Hourly Rate	Typical Hours Worked (Weekly)	Typical Annual Salary	Number of Direct Jobs Related to Project (Average per year)	Total Annual Payroll Related to Project	Duration of Jobs Created by Project	Full-time Equivalent (FTE) Jobs	Total Project Related Payroll (salary/wages only)
Building #1	Warehouse, Production	$13.24	40	$27,539.20	62.4	$1,718,446.08	Permanent	TBD	$1,718,446.08
Building #1					**62.4**	**$1,718,446.08**			**$1,718,446.08**
Building #2	Warehouse, Production	$13.24	40	$27,539.20	69.3	$1,908,466.56	Permanent	TBD	$1,908,466.56
Building #2					**69.3**	**$1,908,466.56**			**$1,908,466.56**
Total Estimated Jobs and Project Payroll (Annually)					**131.7**	**$3,626,912.64**			**$3,626,912.64**

As the proposed tenants for the Project are unknown, AES projected the estimated number of jobs using U.S. Energy Information Administration (USEIA), Office of Energy Consumption and Efficiency Statistics, job creation can be estimated based on the proposed building square footage and national ratios for jobs on a per square foot basis. AES also obtained and used information on hourly wages from Payscale.com. According to Payscale.com, the "Average Production Worker Hourly Pay in Flint, Michigan is $13.24. As the two new industrial buildings are proposed to be 90,000 ft2 and 100,000 ft2 and based on an the USEIA data of "Median square feet per worker" of 1,442 ft2, the estimated new jobs per building to be created are 62.4 FTE and 69.3 FTE, respectively. Based on the foregoing projections, the estimated new permanent FTE jobs payroll being created by the Project is 62.4 FTE X $13.24/Hour for 40 hours per week for 52 weeks/year = $1,718,812.76 and 69.3 FTE X $13.24/Hour for 40 hours per week for 52 weeks/year = $1,909,791.96 or a total estimated payroll of $3,628,604.72. Please see the tables below for a summary of direct economic benefits resulting from the Project.

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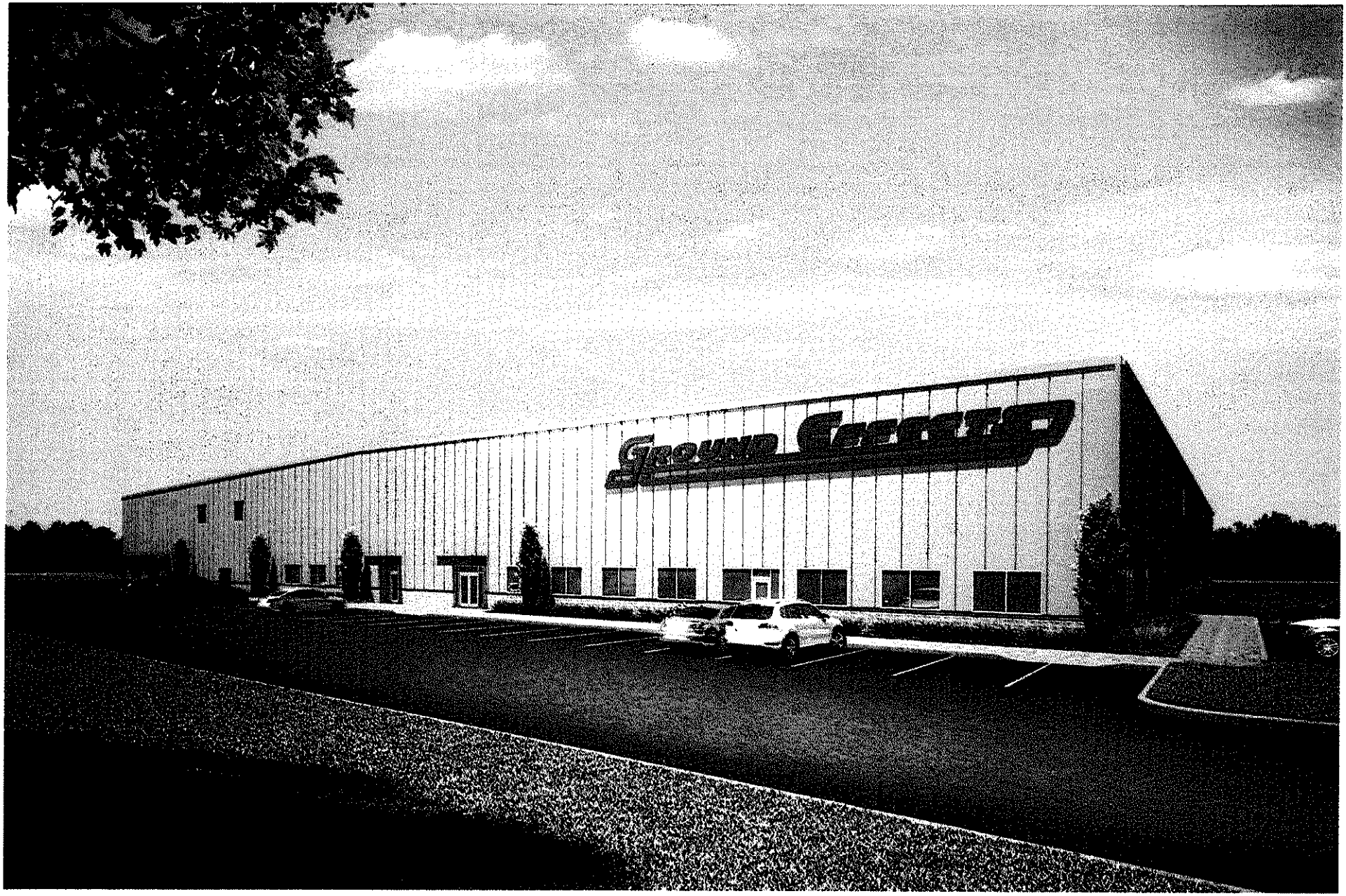
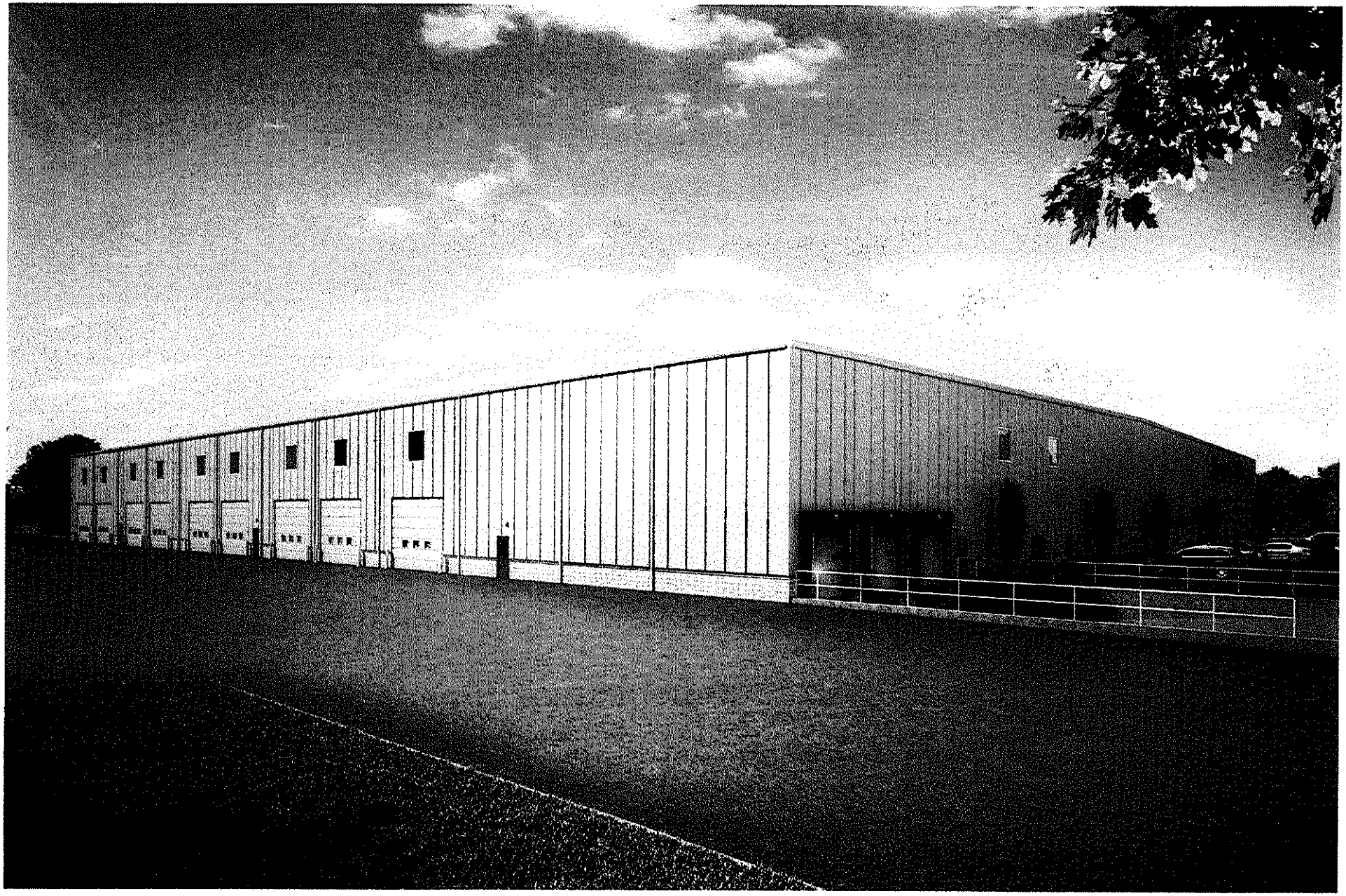
ROWE PROFESSIONAL SERVICES COMPANY
OPTION 4
INDUSTRIAL SITE
FLINT, MICHIGAN
CONCEPT SITE PLAN
HAMILTON AVENUE
JAMES P. COLE BOULEVARD
INDUSTRIAL AVENUE
FLINT RIVER
PROPOSED BUILDING
FUTURE EXPANSION
PARKING EXISTING
PARKING PROPOSED





ATTACHMENT D

Supportive Letters

ATTACHMENT E

Estimated Cost of Eligible Activities Tables

ESTIMATED COST OF ELIGIBLE ACTIVITIES SUMMARY

Description of Eligible Activities	Estimated Cost Bldg#1	Estimated Cost Bldg#2	Activity Total[1]
Brownfield Plan and Act 381 Work Plan			$30,000.00
Baseline Environmental Assessment Activities	$22,900.00	$22,900.00	$45,800.00
Due Care Activities	$328,500.00	$321,500.00	$650,000.00
Response Activities	$83,500.00	$83,500.00	$167,000.00
Demolition Activities	$50,000.00	$225,000.00	$275,000.00
Infrastructure Improvements	$472,948.00	$464,360.00	$937,308.00
Site Preparation	$218,200.00	$218,200.00	$436,400.00
Sub-Total Site Eligible Activities	**$1,176,048.00**	**$1,335,460.00**	**$2,541,508.00**
FBRA Administration Costs			$973,411.00
Local Site Remediation Revolving Fund			$1,044,652.00
Total Estimated Cost to be Funded Through TIF			**$4,559,571.00**

[1]Does not include 15% Act 381 Contingency

October 31, 2020

TABLE 1 - TOTAL PROPOSED EGLE ELIGIBLE ACTIVITY COSTS
BROWNFIELD PLAN
PROPOSED FORMER DUPONT SITE REDEVELOPMENT - Phase 1 (90,000 ft2 bldg)
CITY OF FLINT, GENESEE COUNTY, MICHIGAN

Eligible Activity Description	Brownfield Property Cost		
DEPARTMENT SPECIFIC ACTIVITIES (MCL §125.2652(2)(l)) ELIGIBLE ACTIVITY COSTS			
Baseline Environmental Assessments (MCL §125.2652(2)(l)	**Local TIF Capture Only**	**State and Local TIF Capture**	**TOTAL**
Phase I Environmental Site Assessment	$0	$2,400	$2,400
Phase II Environmental Site Assessment	$0	$15,000	$15,000
Baseline Environmental Assessment	$0	$3,500	$3,500
7a Due Care Plan	$0	$2,000	$2,000
Due Care Activities (MCL §125.2652(2)(l) and (m))			
Section 7aCA Due Care Plan - Revisions/Documentation of Due Care Compliance	$0	$4,500	$4,500
Additional Due Care Phase II ESA Environmental Due Diligence Activities	$0	$40,000	$40,000
Additional Due Care Phase II ESA Environmental Due Diligence Reporting Activities	$0	$3,500	$3,500
Treatment/Disposal of Contaminated Groundwater During Construction (if necessary)	$0	$40,000	$40,000
Soil Staging, Loading, Transportation, and Disposal	$0	$35,000	$35,000
Soil Verification Sampling (if necessary)	$0	$25,000	$25,000
Soil Backfill (Soil, soil placement & compaction)	$0	$5,000	$5,000
Health & Safety Plan	$0	$2,500	$2,500
Project Management	$0	$15,000	$15,000
Soil Erosion Measures	$0	$3,000	$3,000
Incremental Costs for Greenspace Encapsulation (as necessary)	$0	$30,000	$30,000
Incremental Costs for Encapsulation (Engineering controls for Building and Parking)	$0	$50,000	$50,000
Soil Vapor Assessment and Pilot Test	$0	$5,000	$5,000
Soil Vapor Barrier / Sub-slab Depressurization System	$0	$65,000	$65,000
Work Plans, Engineering, Specifications and Reports	$0	$5,000	$5,000
Response Activities (MCL §125.2652(2)(l) and (oo)(l) and (ll))			
Hoist, Trench and Other former Equipment Removal Related Activities (if present)	$0	$15,000	$15,000
UST Removal and Closure (if identified during excavation)	$0	$50,000	$50,000
UST Removal Observation, Sampling and Report (if identified during excavation)	$0	$12,000	$12,000
Work Plans, Engineering, Specifications and Reports	$0	$6,500	$6,500
ENVIRONMENTAL COSTS SUBTOTAL	$0	$434,900	$434,900
TOTAL ELIGIBLE ACTIVITY COSTS PLUS CONTINGENCY AND ADMINISTRATIVE COSTS			
Contingency			
Contingency (15% of Subtotal NOT including completed BEA Activities)	$0.00	$61,800	$61,800
Brownfield Plan, Act 381 Work Plan and Related Documents (MCL §125.2652(2)(o)(l)(D))		$7,500	$7,500
ELIGIBLE ACTIVITY COSTS SUBTOTAL	$0	$504,200	$504,200
Agency Administrative Costs			
State Act 381 Work Plan Review (No longer charged by State)	$0	$0	$0
DBRA Administrative and Operating Costs (15% of TIR Annually)	$0	$0	$0
GRAND TOTAL	$0	$504,200	$504,200

TABLE 2 - TOTAL PROPOSED MSF ELIGIBLE ACTIVITY COSTS
PROPOSED FORMER DUPONT SITE REDEVELOPMENT - Phase 1 (90,000 ft2 bldg)
CITY OF FLINT, GENESEE COUNTY, MICHIGAN

Eligible Activity Description	Brownfield Property Cost
ELIGIBLE ACTIVITIES (MCL 125.2652(2)(o)) MSF ELIGIBLE ACTIVITY COSTS	
Lead, Asbestos and Mold Abatement (MCL §125.2652(2)(o)(i)(G))	
Pre Demolition Hazardous Materials Environmental Assessment (HMEA)	$0
Bid Specs and Bid Evaluation (for HazMat Abatement)	$0
Lead, Asbestos and Mold Abatement Consulting, Management, Design and Planning, Air Monitoring	$0
Site Security (HazMat Abatement and Demolition)	$0
Pre Demolition Asbestos, Lead and Hazardous Materials Abatement	$0
Demolition Activities (MCL §125.2652(2)(o)(i)(F))	
Demolition Engineering, Design and Management, Bid Specs and Evaluation	$15,000
Demolition of Building (Interior and Exterior, Incl Demo & Disp)	$0
Demolition of Building (Utility disconnect and removal)	$0
Demolition of Building (Pavement removal)	$35,000
Infrastructure Improvements (MCL §125.2652(2)(o)(ii)(B))	
Utility Connection & Installation - New site utilities/Utility relocation (water, sewer, gas, etc.)	$472,948
Utility Connection & Installation - Retention/Detention	$0
Public Infrastructure - Storm Sewer	$0
Public Infrastructure - James P. Cole Right-of-Way	$0
Public Infrastructure -	$0
Public Infrastructure -	$0
Site Preparation (MCL §125.2652(2)(o)(ii)(C))	
Geotechnical Testing & Evaluation	$20,000
Soil Mitigation activities	$0
Geotechnically Non-viable Soils Removal	$0
Site Preparation (Exc., Debris removal, etc.)	$25,000
Site Preparation (Rough Grading, etc.)	$132,000
Site Preparation (Finished Grading, etc.)	$28,200
Site Preparation (Specialized foundations)	$0
Site Preparation (Sheeting, shoring, etc.)	$0
Site Preparation - Excavation	$5,000
Site Preparation - Pumping of Groundwater	$8,000
MSF ELIGIBLE ACTIVITY COSTS SUBTOTAL	*$741,148*
TOTAL ELIGIBLE ACTIVITY COSTS PLUS CONTINGENCY	
Contingency (15% of Subtotal)	$111,172
Brownfield Plan, Act 381 Work Plan and Related Documents (MCL §125.2652(2)(o)(i)(D))	$7,500
GRAND TOTAL	**$859,820**

TABLE 1 - TOTAL PROPOSED EGLE ELIGIBLE ACTIVITY COSTS
BROWNFIELD PLAN
PROPOSED FORMER DUPONT SITE REDEVELOPMENT - Phase 1 (100,000 ft2 bldg)
CITY OF FLINT, GENESEE COUNTY, MICHIGAN

Eligible Activity Description	Brownfield Property Cost		
DEPARTMENT SPECIFIC ACTIVITIES (MCL §125.2652(2)(l)) ELIGIBLE ACTIVITY COSTS			
Baseline Environmental Assessments (MCL §125.2652(2)(l)	**Local TIF Capture Only**	**State and Local TIF Capture**	**TOTAL**
Phase I Environmental Site Assessment	$0	$2,400	$2,400
Phase II Environmental Site Assessment	$0	$15,000	$15,000
Baseline Environmental Assessment	$0	$3,500	$3,500
7a Due Care Plan	$0	$2,000	$2,000
Due Care Activities (MCL §125.2652(2)(l) and (m))			
Section 7aCA Due Care Plan - Revisions/Documentation of Due Care Compliance	$0	$4,500	$4,500
Additional Due Care Phase II ESA Environmental Due Diligence Activities	$0	$40,000	$40,000
Additional Due Care Phase II ESA Environmental Due Diligence Reporting Activities	$0	$3,500	$3,500
Treatment/Disposal of Contaminated Groundwater During Construction (if necessary)	$0	$40,000	$40,000
Soil Staging, Loading, Transportation, and Disposal	$0	$35,000	$35,000
Soil Verification Sampling (if necessary)	$0	$25,000	$25,000
Soil Backfill (Soil, soil placement & compaction)	$0	$5,000	$5,000
Health & Safety Plan	$0	$2,500	$2,500
Project Management	$0	$15,000	$15,000
Soil Erosion Measures	$0	$3,000	$3,000
Incremental Costs for Greenspace Encapsulation (as necessary)	$0	$30,000	$30,000
Incremental Costs for Encapsulation (Engineering controls for Building and Parking)	$0	$50,000	$50,000
Soil Vapor Assessment and Pilot Test	$0	$5,000	$5,000
Soil Vapor Barrier / Sub-slab Depressurization System	$0	$58,000	$58,000
Work Plans, Engineering, Specifications and Reports	$0	$5,000	$5,000
Response Activities (MCL §125.2652(2)(f) and (oe)(I) and (ii))			
Hoist, Trench and Other former Equipment Removal Related Activities (if present)	$0	$15,000	$15,000
UST Removal and Closure (if identified during excavation)	$0	$50,000	$50,000
UST Removal Observation, Sampling and Report (if identified during excavation)	$0	$12,000	$12,000
Work Plans, Engineering, Specifications and Reports	$0	$6,500	$6,500
ENVIRONMENTAL COSTS SUBTOTAL	$0	$427,900	$427,900
TOTAL ELIGIBLE ACTIVITY COSTS PLUS CONTINGENCY AND ADMINISTRATIVE COSTS			
Contingency			
Contingency (15% of Subtotal NOT including completed BEA Activities)	$0.00	$60,750	$60,750
Brownfield Plan, Act 381 Work Plan and Related Documents (MCL §125.2652(2)(o)(i)(D))		$7,500	$7,500
ELIGIBLE ACTIVITY COSTS SUBTOTAL	$0	$496,150	$496,150
Agency Administrative Costs			
State Act 381 Work Plan Review (No longer charged by State)	$0	$0	$0
DBRA Administrative and Operating Costs (15% of TIR Annually)	$0	$0	$0
GRAND TOTAL	$0	$496,150	$496,150

October 31, 2020

TABLE 2 - TOTAL PROPOSED MSF ELIGIBLE ACTIVITY COSTS
PROPOSED FORMER DUPONT SITE REDEVELOPMENT - Phase 1 (100,000 ft2 bldg)
CITY OF FLINT, GENESEE COUNTY, MICHIGAN

Eligible Activity Description	Brownfield Property Cost
ELIGIBLE ACTIVITIES (MCL 125.2652(2)(o)) MSF ELIGIBLE ACTIVITY COSTS	
Lead, Asbestos and Mold Abatement (MCL §125.2652(2)(o)(i)(G))	
Pre Demolition Hazardous Materials Environmental Assessment (HMEA)	$0
Bid Specs and Bid Evaluation (for HazMat Abatement)	$0
Lead, Asbestos and Mold Abatement Consulting, Management, Design and Planning, Air Monitoring	$0
Site Security (HazMat Abatement and Demolition)	$0
Pre Demolition Asbestos, Lead and Hazardous Materials Abatement	$0
Demolition Activities (MCL §125.2652(2)(o)(i)(F))	
Demolition Engineering, Design and Management, Bid Specs and Evaluation	$15,000
Demolition of Building (Interior and Exterior, Incl Demo & Disp)	$90,000
Demolition of Building (Utility disconnect and removal)	$25,000
Demolition of Building (Pavement removal)	$95,000
Infrastructure Improvements (MCL §125.2652(2)(o)(ii)(B))	
Utility Connection & Installation - New site utilities/Utility relocation (water, sewer, gas, etc.)	$464,360
Utility Connection & Installation - Retention/Detention	$0
Public Infrastructure - Storm Sewer	$0
Public Infrastructure - James P. Cole Right-of-Way	$0
Public Infrastructure -	$0
Public Infrastructure -	$0
Site Preparation (MCL §125.2652(2)(o)(ii)(C))	
Geotechnical Testing & Evaluation	$20,000
Soil Mitigation activities	$0
Geotechnically Non-viable Soils Removal	$0
Site Preparation (Exc., Debris removal, etc.)	$25,000
Site Preparation (Rough Grading, etc.)	$132,000
Site Preparation (Finished Grading, etc.)	$28,200
Site Preparation (Specialized foundations)	$0
Site Preparation (Sheeting, shoring, etc.)	$0
Site Preparation - Excavation	$5,000
Site Preparation - Pumping of Groundwater	$8,000
MSF ELIGIBLE ACTIVITY COSTS SUBTOTAL	*$907,560*
TOTAL ELIGIBLE ACTIVITY COSTS PLUS CONTINGENCY	
Contingency (15% of Subtotal)	$136,134
Brownfield Plan, Act 381 Work Plan and Related Documents (MCL §125.2652(2)(o)(i)(D))	$7,500
GRAND TOTAL	**$1,051,194**

ATTACHMENT F

TIF Tables

FINAL DRAFT FOR REVIEW AND APPROVAL

Tax Increment Revenue Capture Estimates
Former DuPont Facility Redevelopment
James P. Cole Blvd
Flint, Genesee County, Michigan
October 31, 2020

EXHIBIT A: TIF TABLE

Estimated Taxable Value (TV) Increase Rate: 1% per year

	Millage Rate	1	2	3	4	5	6	7	8	9
Plan Year		1	2	3	4	5	6	7	8	9
Calendar Year		2021	2022	2023	2024	2025	2026	2027	2028	2029
*Base Taxable Value		$ 34,000	$ 34,000	$ 34,000	$ 34,000	$ 34,000	$ 34,000	$ 34,000	$ 34,000	$ 34,000
Estimated New TV		$ 4,631,750	$ 4,677,563	$ 4,724,338	$ 4,771,582	$ 4,819,297	$ 4,867,490	$ 4,916,165	$ 4,965,327	$ 5,014,980
Incremental Difference (New TV - Base TV)		$ 4,597,750	$ 4,643,563	$ 4,690,338	$ 4,737,582	$ 4,785,297	$ 4,833,490	$ 4,882,165	$ 4,931,327	$ 4,980,980
School Capture	**Millage Rate**									
State Education Tax (SET)	6.0000	$ 27,584	$ 27,861	$ 28,142	$ 28,425	$ 28,712	$ 29,001	$ 29,293	$ 29,588	$ 29,886
School Operating Tax	18.0000	$ 82,751	$ 83,584	$ 84,426	$ 85,276	$ 86,135	$ 87,001	$ 87,879	$ 88,764	$ 89,658
School Total	24.0000									
Local Capture	**Millage Rate**									
County Operating	5.4608	$ 25,105	$ 25,358	$ 25,613	$ 25,871	$ 26,132	$ 26,395	$ 26,661	$ 26,929	$ 27,200
Library	4.0000	$ 18,389	$ 18,574	$ 18,761	$ 18,950	$ 19,141	$ 19,334	$ 19,529	$ 19,725	$ 19,924
Flint Operating	7.5000	$ 34,479	$ 34,827	$ 35,178	$ 35,532	$ 35,890	$ 36,251	$ 36,616	$ 36,985	$ 37,357
Public Safety	6.0000	$ 27,584	$ 27,861	$ 28,142	$ 28,425	$ 28,712	$ 29,001	$ 29,293	$ 29,588	$ 29,886
Misc. Levies	9.0594	$ 41,648	$ 42,068	$ 42,492	$ 42,920	$ 43,352	$ 43,789	$ 44,229	$ 44,675	$ 45,125
Genesee County Parks	0.7478	$ 3,438	$ 3,472	$ 3,507	$ 3,543	$ 3,578	$ 3,614	$ 3,651	$ 3,688	$ 3,725
Parks and Rec	0.5000	$ 2,299	$ 2,322	$ 2,345	$ 2,369	$ 2,393	$ 2,417	$ 2,441	$ 2,466	$ 2,490
Genesee ISD	3.7457	$ 17,220	$ 17,394	$ 17,569	$ 17,746	$ 17,924	$ 18,105	$ 18,287	$ 18,471	$ 18,657
Mass Transit	1.2221	$ 5,618	$ 5,675	$ 5,732	$ 5,790	$ 5,848	$ 5,907	$ 5,966	$ 6,027	$ 6,087
Flint Sinking Fund	1.1800	$ 5,425	$ 5,479	$ 5,535	$ 5,590	$ 5,647	$ 5,704	$ 5,761	$ 5,819	$ 5,878
CS Mott Operating	1.9705	$ 9,059	$ 9,150	$ 9,242	$ 9,335	$ 9,429	$ 9,524	$ 9,620	$ 9,717	$ 9,815
Local Total	41.3863									
		65.3863	[illegible]							
Non-Capturable Millages	**Millage Rate**									
Flint School Debt	2.82000	$ 12,964	$ 13,095	$ 13,227	$ 13,360	$ 13,495	$ 13,630	$ 13,768	$ 13,906	$ 14,046
CS Mott Debt	0.79000	$ 3,632	$ 3,668	$ 3,705	$ 3,743	$ 3,780	$ 3,818	$ 3,857	$ 3,896	$ 3,935
Public Library Debt	1.82000	$ 8,367	$ 8,451	$ 8,536	$ 8,622	$ 8,709	$ 8,797	$ 8,886	$ 8,975	$ 9,065
	0.00000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Non-Capturable Taxes	5.43000									
TOTAL MILLS		70.8163								
Total Tax Increment Revenue (TIR) Available for Capture		$ 300,597	$ 303,625	$ 306,684	$ 309,773	$ 312,893	$ 316,044	$ 319,227	$ 322,443	$ 325,690

	10	11	12	13	14	15	16	17
Plan Year	10	11	12	13	14	15	16	17
Calendar Year	2030	2031	2032	2033	2034	2035	2036	2037
*Base Taxable Value	$ 34,000	$ 34,000	$ 34,000	$ 34,000	$ 34,000	$ 34,000	$ 34,000	$ 34,000
Estimated New TV	$ 5,065,130	$ 5,115,781	$ 5,166,939	$ 5,218,608	$ 5,270,795	$ 5,323,502	$ 5,376,737	$ 5,430,505
Incremental Difference (New TV - Base TV)	$ 5,031,130	$ 5,081,781	$ 5,132,939	$ 5,184,608	$ 5,236,795	$ 5,289,502	$ 5,342,737	$ 5,396,505
School Capture								
State Education Tax (SET)	$ 30,187	$ 30,491	$ 30,798	$ 31,108	$ 31,421	$ 31,737	$ 32,056	$ 32,379
School Operating Tax	$ 90,560	$ 91,472	$ 92,393	$ 93,323	$ 94,262	$ 95,211	$ 96,169	$ 97,137
Local Capture								
County Operating	$ 27,474	$ 27,751	$ 28,030	$ 28,312	$ 28,597	$ 28,885	$ 29,176	$ 29,469
Library	$ 20,125	$ 20,327	$ 20,532	$ 20,738	$ 20,947	$ 21,158	$ 21,371	$ 21,586
Flint Operating	$ 37,733	$ 38,113	$ 38,497	$ 38,885	$ 39,276	$ 39,671	$ 40,071	$ 40,474
Public Safety	$ 30,187	$ 30,491	$ 30,798	$ 31,108	$ 31,421	$ 31,737	$ 32,056	$ 32,379
Misc. Levies	$ 45,579	$ 46,038	$ 46,501	$ 46,969	$ 47,442	$ 47,920	$ 48,402	$ 48,889
Genesee County Parks	$ 3,762	$ 3,800	$ 3,838	$ 3,877	$ 3,916	$ 3,955	$ 3,995	$ 4,036
Parks and Rec	$ 2,516	$ 2,541	$ 2,566	$ 2,592	$ 2,618	$ 2,645	$ 2,671	$ 2,698
Genesee ISD	$ 18,845	$ 19,035	$ 19,226	$ 19,420	$ 19,615	$ 19,813	$ 20,012	$ 20,214
Mass Transit	$ 6,149	$ 6,210	$ 6,273	$ 6,336	$ 6,400	$ 6,464	$ 6,529	$ 6,595
Flint Sinking Fund	$ 5,937	$ 5,997	$ 6,057	$ 6,118	$ 6,179	$ 6,241	$ 6,304	$ 6,368
CS Mott Operating	$ 9,914	$ 10,014	$ 10,114	$ 10,216	$ 10,319	$ 10,423	$ 10,528	$ 10,634
Non-Capturable Millages								
Flint School Debt	$ 14,188	$ 14,331	$ 14,475	$ 14,621	$ 14,768	$ 14,916	$ 15,067	$ 15,218
CS Mott Debt	$ 3,975	$ 4,015	$ 4,055	$ 4,096	$ 4,137	$ 4,179	$ 4,221	$ 4,263
Public Library Debt	$ 9,157	$ 9,249	$ 9,342	$ 9,436	$ 9,531	$ 9,627	$ 9,724	$ 9,822
	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Tax Increment Revenue (TIR) Available for Capture	$ 328,967	$ 332,279	$ 335,624	$ 339,002	$ 342,415	$ 345,861	$ 349,342	$ 352,857

Footnotes:

Tax Increment Revenue Capture Estimates
Former DuPont Facility Redevelopment
James P. Cole Blvd
Flint, Genesee County, Michigan
October 31, 2020

FINAL DRAFT FOR REVIEW AND APPROVAL

EXHIBIT A: TIF TABLE

Estimated Taxable Value (TV) Increase Rate

		18	19	20	21	22	23	24	25	26	27	28	29	30	TOTAL
Plan Year		18	19	20	21	22	23	24	25	26	27	28	29	30	
Calendar Year		2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	
*Base Taxable Value		$ 34,000	$ 34,000	$ 34,000	$ 34,000	$ 34,000	$ 34,000	$ 34,000	$ 34,000	$ 34,000	$ 34,000	$ 34,000	$ 34,000	$ 34,000	
Estimated New TV		$ 5,484,810	$ 5,539,658	$ 5,595,055	$ 5,651,005	$ 5,707,515	$ 5,764,590	$ 5,822,236	$ 5,880,459	$ 5,939,263	$ 5,998,656	$ 6,058,642	$ 6,119,229	$ 6,180,421	
Incremental Difference (New TV - Base TV)		$ 5,450,810	$ 5,505,658	$ 5,561,055	$ 5,617,005	$ 5,673,515	$ 5,730,590	$ 5,788,236	$ 5,846,459	$ 5,905,263	$ 5,964,656	$ 6,024,642	$ 6,085,229	$ 6,146,421	
School Capture	**Millage Rate**														
State Education Tax (SET)	6.0000	$ 32,705	$ 33,034	$ 33,366	$ 33,702	$ 34,041	$ 34,384	$ 34,729	$ 35,079	$ 35,432	$ 35,788	$ 36,148	$ 36,511	$ 36,879	$ 960,465
School Operating Tax	18.0000	$ 98,115	$ 99,102	$ 100,099	$ 101,106	$ 102,123	$ 103,151	$ 104,188	$ 105,236	$ 106,295	$ 107,364	$ 108,444	$ 109,534	$ 110,636	$ 2,881,496
School Total	24.0000														
Local Capture	**Millage Rate**														
County Operating	5.4608	$ 29,766	$ 30,065	$ 30,368	$ 30,673	$ 30,982	$ 31,294	$ 31,608	$ 31,926	$ 32,247	$ 32,572	$ 32,899	$ 33,230	$ 33,564	$ 874,151
Library	4.0000	$ 21,803	$ 22,023	$ 22,244	$ 22,468	$ 22,694	$ 22,922	$ 23,153	$ 23,386	$ 23,621	$ 23,859	$ 24,099	$ 24,341	$ 24,586	$ 640,310
Flint Operating	7.5000	$ 40,881	$ 41,292	$ 41,708	$ 42,128	$ 42,551	$ 42,979	$ 43,412	$ 43,848	$ 44,289	$ 44,735	$ 45,185	$ 45,639	$ 46,098	$ 1,200,583
Public Safety	6.0000	$ 32,705	$ 33,034	$ 33,366	$ 33,702	$ 34,041	$ 34,384	$ 34,729	$ 35,079	$ 35,432	$ 35,788	$ 36,148	$ 36,511	$ 36,879	$ 960,465
Misc. Levies	9.0594	$ 49,381	$ 49,878	$ 50,380	$ 50,887	$ 51,399	$ 51,916	$ 52,438	$ 52,965	$ 53,498	$ 54,036	$ 54,580	$ 55,129	$ 55,683	$ 1,450,206
Genesee County Parks	0.7478	$ 4,076	$ 4,117	$ 4,159	$ 4,200	$ 4,243	$ 4,285	$ 4,328	$ 4,372	$ 4,416	$ 4,460	$ 4,505	$ 4,551	$ 4,596	$ 119,706
Parks and Rec	0.5000	$ 2,725	$ 2,753	$ 2,781	$ 2,809	$ 2,837	$ 2,865	$ 2,894	$ 2,923	$ 2,953	$ 2,982	$ 3,012	$ 3,043	$ 3,073	$ 80,039
Genesee ISD	3.7457	$ 20,417	$ 20,623	$ 20,830	$ 21,040	$ 21,251	$ 21,465	$ 21,681	$ 21,899	$ 22,119	$ 22,342	$ 22,567	$ 22,793	$ 23,023	$ 599,602
Mass Transit	1.2223	$ 6,661	$ 6,728	$ 6,796	$ 6,865	$ 6,934	$ 7,004	$ 7,074	$ 7,145	$ 7,217	$ 7,289	$ 7,363	$ 7,437	$ 7,512	$ 195,661
Flint Sinking Fund	1.1800	$ 6,432	$ 6,497	$ 6,562	$ 6,628	$ 6,695	$ 6,762	$ 6,830	$ 6,899	$ 6,968	$ 7,038	$ 7,109	$ 7,181	$ 7,253	$ 188,891
CS Mott Operating	1.9705	$ 10,741	$ 10,849	$ 10,958	$ 11,068	$ 11,180	$ 11,292	$ 11,406	$ 11,520	$ 11,636	$ 11,753	$ 11,872	$ 11,991	$ 12,112	$ 315,433
Local Total	41.2863														
	65.2863														
Non-Capturable Millages	**Millage Rate**														
Flint School Debt	2.82000	$ 15,471	$ 15,626	$ 15,783	$ 15,940	$ 16,100	$ 16,261	$ 16,424	$ 16,587	$ 16,753	$ 16,920	$ 17,089	$ 17,260	$ 17,434	$ 451,419
CS Mott Debt	0.79000	$ 4,306	$ 4,349	$ 4,393	$ 4,437	$ 4,482	$ 4,527	$ 4,571	$ 4,619	$ 4,665	$ 4,712	$ 4,759	$ 4,807	$ 4,856	$ 126,462
Public Library Debt	1.82000	$ 9,920	$ 10,020	$ 10,121	$ 10,223	$ 10,326	$ 10,430	$ 10,535	$ 10,641	$ 10,748	$ 10,856	$ 10,965	$ 11,075	$ 11,186	$ 291,402
	0.00000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Non-Capturable Taxes	5.43000														$ 869,221
TOTAL MILLS	70.7163														
Total Tax Increment Revenue (TIR) Available for Capture		$ 356,408	$ 359,995	$ 363,617	$ 367,275	$ 370,970	$ 374,702	$ 378,471	$ 382,278	$ 386,123	$ 390,007	$ 393,929	$ 397,893	$ 401,897	[redacted]

Footnotes:

Tax Increment Revenue Capture Estimates
Former DuPont Facility Redevelopment
James P. Cole Blvd
Flint, Genesee County, Michigan
October 31, 2020

EXHIBIT A: TIF TABLE

				Section O Capture Summary Table		
	Estimated Taxable Value (TV) Increase Rate					
	Plan Year			Developer P&I	Local RLF	State Brownfield RLF
	Calendar Year					
	*Base Taxable Value					
	Estimated New TV					
	Incremental Difference (New TV - Base TV)					

School Capture	Millage Rate		School Capture	Developer P&I	Local RLF	State Brownfield RLF
State Education Tax (SET)	6.0000		State Education Tax (SET)	$ 727,134.24	$ 81,770.21	$ 404,887
School Operating Tax	18.0000		School Operating Tax	$ 1,478,567	$ 490,622	
School Total	24.0000					

Local Capture	Millage Rate		Local Capture	Developer P&I	Local RLF	State Brownfield RLF
County Operating	5.4608		County Operating	$ 404,411	$ 148,843	
Library	4.0000		Library	$ 290,155	$ 109,027	
Flint Operating	7.5000		Flint Operating	$ 555,291	$ 204,426	
Public Safety	6.0000		Public Safety	$ 444,232	$ 163,543	
Misc. Levies	9.0594		Misc. Levies	$ 670,247	$ 246,930	
Genesee County Parks	0.7478		Genesee County Parks	$ 55,366	$ 20,381	
Parks and Rec	0.5000		Parks and Rec	$ 37,019	$ 13,628	
Genesee ISD	3.7457		Genesee ISD	$ 277,327	$ 102,096	
Mass Transit	1.2221		Mass Transit	$ 90,484	$ 33,330	
Flint Sinking Fund	1.1800		Flint Sinking Fund	$ 87,364	$ 32,163	
CS Mott Operating	1.9705		CS Mott Operating	$ 145,894	$ 53,709	
Local Total	41.3463		TOTAL	$ 4,715,373	$ 1,700,440	$ 101,887
		65.3463	In addition, the following taxes are projected to be generated but shall not be captured during the life of this Plan			

Non-Capturable Millages	Millage Rate		Non-Capturable Millages	Developer P&I	Local RLF	State Brownfield RLF
Flint School Debt	2.82000		Flint School Debt	$ 209,792	$ 76,884	
CS Mott Debt	0.79000		CS Mott Debt	$ 58,491	$ 21,533	
Public Library Debt	1.87000		Public Library Debt	$ 138,751	$ 49,597	
	0.00000					
Total Non-Capturable Taxes	5.49000		TOTAL	$ 402,030	$ 148,004	
TOTAL MILLS		70.8363				

Total Tax Increment Revenue (TIR) Available for Capture

Footnotes:

Tax Increment Revenue Reimbursement Allocation Table
Former DuPont Facility Redevelopment
James P. Cole Blvd, Flint, Genesee County, Michigan
October 31, 2020

FINAL DRAFT FOR REVIEW AND APPROVAL

EXHIBIT A: TIF TABLE

Developer Maximum Reimbursement	Proportionality	School & Local Taxes	Local-Only Taxes	Total
State	36.70%	$ 1,050,107		$ 1,050,107
Local	63.30%	$ 1,810,835		$ 1,810,835
TOTAL				
EGLE	35%	$ 1,000,350		$ 1,000,350
MSF	65%	$ 1,860,592		$ 1,860,592

Estimated Total	
Years of Plan:	[illegible]

Estimated Capture	
Administrative Fees	$ 973,411
State Brownfield Redevelopment	$ 303,887
Local Brownfield Revolving Fund	$ 1,044,652

	Beginning Balance	1 (2021)	2 (2022)	3 (2023)	4 (2024)	5 (2025)	6 (2026)	7 (2027)	8 (2028)	9 (2029)
Total State Incremental Revenue		$ 110,334	$ 111,446	$ 112,568	$ 113,702	$ 114,847	$ 116,004	$ 117,172	$ 118,352	$ 119,544
State Brownfield Redevelopment Fund (50% of SET)		$ 13,792	$ 13,931	$ 14,071	$ 14,213	$ 14,356	$ 14,500	$ 14,646	$ 14,794	$ 14,943
State TIR Available for Reimbursement		$ 96,542	$ 97,515	$ 98,497	$ 99,489	$ 100,491	$ 101,503	$ 102,525	$ 103,558	$ 104,601
Total Local Incremental Revenue		$ 190,263	$ 192,180	$ 194,116	$ 196,071	$ 198,046	$ 200,040	$ 202,055	$ 204,089	$ 206,144
BRA Administrative Fee (15%, Maximum $100K/Year)		$ 25,000	$ 45,544	$ 46,003	$ 46,466	$ 46,934	$ 47,407	$ 47,884	$ 48,366	$ 48,853
Local TIR Available for Reimbursement		$ 165,263	$ 146,634	$ 148,113	$ 149,605	$ 151,112	$ 152,634	$ 154,171	$ 155,723	$ 157,291
[illegible]		$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]
DEVELOPER										
DEVELOPER Reimbursement Balance	$ 2,860,942	$ 2,599,137	$ 2,354,[illegible]	$ 2,[illegible]	$ 1,[illegible]	$ 1,[illegible]	$ 1,[illegible]	$ 1,09[illegible]	$ 837,564	$ [illegible]
AVAILABLE TIR (AFTER Developer Principal Reimbursement)										
DEVELOPER Cumulative Interest			$ 271,003.91	$ 390,753.21	$ 496,171.99	$ 589,136.05	$ 669,519.95	$ 737,397.01	$ 792,039.26	$ 833,917.45
INTEREST PAYMENTS TO DEVELOPER										
INTEREST BALANCE OWED TO DEVELOPER										
AVAILABLE TIR (AFTER Developer Reimbursement)										
MSF Non-Environmental Costs	$ 1,860,592	$ 170,263	$ 158,782	$ 160,382	$ 161,997	$ 163,628	$ 165,276	$ 166,940	$ 168,622	$ 170,319
State Tax Reimbursement		$ 62,495	$ 58,281	$ 58,868	$ 59,461	$ 60,060	$ 60,664	$ 61,275	$ 61,892	$ 62,516
Local Tax Reimbursement		$ 107,768	$ 100,501	$ 101,513	$ 102,536	$ 103,569	$ 104,612	$ 105,665	$ 106,729	$ 107,804
Total MSF Reimbursement Balance		$ 1,690,329	$ 2,531,547	$ 1,371,166	$ 1,209,169	$ 1,045,541	$ 880,265	$ 713,325	$ 544,703	$ 374,384
MDEQ Environmental Costs	$ 1,000,350	$ 91,542	$ 85,369	$ 86,229	$ 87,098	$ 87,975	$ 88,861	$ 89,756	$ 90,660	$ 91,572
State Tax Reimbursement		$ -	$ 31,335	$ 31,650	$ 31,969	$ 32,291	$ 32,616	$ 32,945	$ 33,277	$ 33,612
Local Tax Reimbursement		$ -	$ 54,034	$ 54,579	$ 55,129	$ 55,684	$ 56,245	$ 56,811	$ 57,383	$ 57,961
Total MDEQ Reimbursement Balance		$ 908,808	$ 823,439	$ 737,209	$ 650,112	$ 562,137	$ 472,276	$ 383,520	$ 292,861	$ 201,289
Local Only Costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Local Tax Reimbursement										
Total Local Only Reimbursement Balance		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
[illegible]		$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]

	10 (2030)	11 (2031)	12 (2032) Developer Principal Paid	13 (2033)	14 (2034)	15 (2035)	16 (2036)	17 (2037)
Total State Incremental Revenue	$ 120,747	$ 121,963	$ 123,191	$ 124,431	$ 125,683	$ 126,948	$ 128,226	$ 129,516
State Brownfield Redevelopment Fund (50% of SET)	$ 15,083	$ 15,246	$ 15,399	$ 15,554	$ 15,710	$ 15,869	$ 16,029	$ 16,190
State TIR Available for Reimbursement	$ 105,664	$ 106,717	$ 107,792	$ 108,877	$ 109,973	$ 111,080	$ 112,197	$ 113,327
Total Local Incremental Revenue	$ 208,220	$ 210,316	$ 212,433	$ 214,572	$ 216,732	$ 218,913	$ 221,116	$ 223,341
BRA Administrative Fee (15%, Maximum $100K/Year)	$ 49,345	$ 49,842	$ 50,343	$ 50,851	$ 51,362	$ 51,879	$ 52,401	$ 52,929
Local TIR Available for Reimbursement	$ 158,875	$ 160,474	$ 162,090	$ 163,721	$ 165,368	$ 167,024	$ 168,718	$ 170,413
[illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ 272,598	$ 275,342	$ 278,113	$ 280,912	$ [illegible]
DEVELOPER								
DEVELOPER Reimbursement Balance	$ [illegible]	$ 321,344	$ 48,[illegible]	$ ([illegible])	$ ([illegible])	$ ([illegible])	$ ([illegible])	$ ([illegible])
AVAILABLE TIR (AFTER Developer Principal Reimbursement)								
DEVELOPER Cumulative Interest	$ 862,701.06	$ 878,258.24	$ 880,455.84	$ 654,526.28	$ 381,928.30	$ 106,586.06		$ -
INTEREST PAYMENTS TO DEVELOPER			$ 225,930	$ 272,598	$ 275,342	$ 106,586		
INTEREST BALANCE OWED TO DEVELOPER			$ 654,526.28	$ 381,928.30	$ 106,586.06	$ (171,527.28)		
AVAILABLE TIR (AFTER Developer Reimbursement)								
MSF Non-Environmental Costs	$ 172,034	$ 173,766	$ 175,515	$ 177,282	$ 179,067	$ 180,869	$ 182,689	$ 184,528
State Tax Reimbursement	$ 63,145	$ 63,781	$ 64,423	$ 65,071	$ 65,726	$ 66,388	$ 67,056	$ 67,731
Local Tax Reimbursement	$ 108,889	$ 109,985	$ 111,093	$ 112,211	$ 113,340	$ 114,481	$ 115,633	$ 116,797
Total MSF Reimbursement Balance	$ 202,350	$ 28,584	$ (146,932)	$ (324,214)	$ (503,280)	$ (684,149)	$ (866,838)	$ (1,051,366)
MDEQ Environmental Costs	$ 92,494	$ 93,426	$ 94,366	$ 95,316	$ 96,275	$ 97,244	$ 98,223	$ 99,212
State Tax Reimbursement	$ 33,950	$ 34,292	$ 34,637	$ 34,986	$ 35,338	$ 35,694	$ 36,053	$ 36,416
Local Tax Reimbursement	$ 58,544	$ 59,134	$ 59,729	$ 60,330	$ 60,938	$ 61,551	$ 62,170	$ 62,796
Total MDEQ Reimbursement Balance	$ 108,794	$ 15,368	$ (78,998)	$ (174,314)	$ (270,589)	$ (367,834)	$ (466,057)	$ (565,269)
Local Only Costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Local Tax Reimbursement								
Total Local Only Reimbursement Balance	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
[illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]

LOCAL BROWNFIELD REVOLVING FUND

	Beginning	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
LBRF Deposits *		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -								
State Tax Capture	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -		$ 36,053	$ 36,416
Local Tax Capture	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -		$ 168,715	$ 170,413
Total LBRF Capture	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 204,768	$ 206,828

* Up to five years of capture for LBRF Deposits after eligible activities are reimbursed. May be taken from DEQ & Local TIR only.

Footnotes:

FBRA administrative fee is 15% with a $100,000 cap. This amount may be adjusted downward or upward based upon a plan's proportionate share of all tax increment revenue available and based upon maximum amounts that an authority can capture for administrative fees per PA 381.

EXHIBIT A: TIF TABLE

Tax Increment Revenue Reimbursement Allocation Table
Former DuPont Facility Redevelopment
James P. Cole Blvd, Flint, Genesee County, Michigan
October 31, 2020

FINAL DRAFT FOR REVIEW AND APPROVAL

	18 2038	19 2039	20 2040	21 2041	22 2042	23 2043	24 2044	25 2045	26 2046	27 2047	28 2048	29 2049	30 2050	TOTAL
Total State Incremental Revenue	$ 130,819	$ 132,136	$ 133,465	$ 134,808	$ 136,164	$ 137,534	$ 138,918	$ 140,315	$ 141,726	$ 143,152	$ 144,591	$ 146,045	$ 147,514	$ 3,841,861
State Brownfield Redevelopment Fund (50% of SET)	$ 16,352	$ 16,517	$ 16,683											$ 303,887
State TIR Available for Reimbursement	$ 114,467	$ 115,618	$ 116,782	$ 134,808	$ 136,164	$ 137,534	$ 138,918	$ 140,315	$ 141,726	$ 143,152	$ 144,591	$ 146,045	$ 147,514	$ 3,537,974
Total Local Incremental Revenue	$ 225,589	$ 227,859	$ 230,151	$ 232,467	$ 234,806	$ 237,168	$ 239,554	$ 241,963	$ 244,397	$ 246,855	$ 249,338	$ 251,845	$ 254,378	$ 4,625,017
BRA Administrative Fee (15%, Maximum $100K/Year)	$ 53,461	$ [illegible]	$ [illegible]											$ 973,411
Local TIR Available for Reimbursement	$ 172,128	$ 173,860	$ 175,609	$ 232,467	$ 234,806	$ 237,168	$ 239,554	$ 241,963	$ 244,397	$ 246,855	$ 249,338	$ 251,845	$ 254,378	$ [illegible]
[illegible]	$ [illegible]	$ [illegible]	$ 292,391	$ 367,275	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ 401,892	$ [illegible]
DEVELOPER														
DEVELOPER Reimbursement Balance	$ (1,903,229)	$ (2,192,708)	$ (2,485,099)	$ (2,852,374)	$ (3,223,344)	$ (3,598,046)	$ (3,976,518)	($4,358,796)	($4,744,919)	($5,134,926)	($5,528,855)	($5,926,746)	($6,328,638)	
[illegible]														$0.00
[illegible]														$880,455.34
DEVELOPER Cumulative Interest	$ -	$ -	$	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
INTEREST PAYMENTS TO DEVELOPER						$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$880,455.34
INTEREST BALANCE OWED TO DEVELOPER														
CUMULATIVE INTEREST PAYMENTS TO DEVELOPER						$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
AVAILABLE TIR (AFTER Developer Reimbursement)														
MSF Non-Environmental Costs	$ 186,385	$ 188,260	$ 190,154	$ 238,855	$ 241,258	$ 243,685	$ 246,136	$ 248,612	$ 251,112	$ 253,638	$ 256,189	$ 258,765	$ 261,367	$ 5,976,374
State Tax Reimbursement	$ 68,412	$ 69,101	$ 69,796	$ 87,671	$ 88,553	$ 89,444	$ 90,344	$ 91,253	$ 92,171	$ 93,098	$ 94,034	$ 94,980	$ 95,935	$ 2,193,624
Local Tax Reimbursement	$ 117,972	$ 119,159	$ 120,358	$ 151,183	$ 152,704	$ 154,240	$ 155,792	$ 157,359	$ 158,942	$ 160,540	$ 162,155	$ 163,786	$ 165,433	$ 3,782,749
Total MSF Reimbursement Balance	$ (1,237,751)	$ (1,436,011)	$ (1,616,165)	$ (1,855,020)	$ (2,096,278)	$ (2,339,962)	$ (2,586,098)	$ (2,834,720)	$ (3,085,822)	$ (3,339,460)	$ (3,595,649)	$ (3,854,414)	$ (4,115,782)	$ -
MDEQ Environmental Costs	$ 100,210	$ 101,218	$ 102,237	$ 128,421	$ 129,713	$ 131,017	$ 132,335	$ 133,666	$ 135,011	$ 136,369	$ 137,740	$ 139,125	$ 140,524	$ 3,313,206
State Tax Reimbursement	$ 36,782	$ 37,152	$ 37,526	$ 47,137	$ 47,611	$ 48,090	$ 48,574	$ 49,062	$ 49,556	$ 50,054	$ 50,557	$ 51,066	$ 51,579	$ 1,145,806
Local Tax Reimbursement	$ 63,428	$ 64,066	$ 64,711	$ 81,284	$ 82,102	$ 82,928	$ 83,762	$ 84,604	$ 85,455	$ 86,315	$ 87,183	$ 88,060	$ 88,945	$ 1,975,859
Total MDEQ Reimbursement Balance	$ (665,479)	$ (766,697)	$ (868,934)	$ (997,354)	$ (1,127,067)	$ (1,258,084)	$ (1,390,420)	$ (1,524,086)	$ (1,659,097)	$ (1,795,466)	$ (1,932,206)	$ (2,072,331)	$ (2,212,856)	$ -
Local Only Costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -		$ -	$ -	$ -	$ -
Local Tax Reimbursement														
Total Local Only Reimbursement Balance	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -		$ -	$ -	$ -	$ -
Total Annual Developer Reimbursement	$ 286,595	$ 289,478	$ 292,391	$ 367,275	$ 370,970	$ 374,702	$ 378,471	$ 382,278	$ 386,123	$ 390,007	$ 393,929	$ 397,892	$ 401,892	$ 9,189,580

LOCAL BROWNFIELD REVOLVING FUND	18	19	20	21	22	23	24	25	26	27	28	29	30	TOTAL
LBRF Deposits *														
State Tax Capture	$ 36,782	$ 37,152	$ 37,526	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ [illegible]
Local Tax Capture	$ 172,128	$ 173,860	$ 175,609	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ [illegible]
Total LBRF Capture	$ 208,910	$ 211,012	$ 213,135	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ [illegible]

* Up to five years of capture for LBRF Deposits after el

Footnotes:

FBRA administrative fee is 15% with a $100,000 cap. Tl
plan's proportionate share of all tax increment revenu
capture for administrative fees per PA 381.

ATTACHMENT G

Environmental Department Acknowledgement and Other Environmental Documents

RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE

C. HEIDI GRETHER
DIRECTOR

September 17, 2018

ACKNOWLEDGEMENT OF RECEIPT OF A BASELINE ENVIRONMENTAL ASSESSMENT

BEA ID: B201802506LA

Legal Entity: James P Cole Venture LLC, 27 Forest Lane, South Barrington, Illinois 60010

Property Address: 1809 James P Cole Boulevard, Flint, Genesee County, Michigan

On September 13, 2018, the Michigan Department of Environmental Quality (MDEQ) received a Baseline Environmental Assessment (BEA) dated September 10, 2018, for the above legal entity and property. This letter is your acknowledgement that the MDEQ has received and recorded the BEA. The MDEQ maintains an administrative record of each BEA as received.

This BEA was submitted pursuant to Section 20126(1)(c) of Part 201, Environmental Remediation, and/or Section 21323a(1)(b) of Part 213, Leaking Underground Storage Tanks, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). A BEA is submitted for the purpose of establishing an exemption to liability for a new owner or operator of property that has been demonstrated to be a facility or property as defined by Section 20101(1)(s) of Part 201, Environmental Remediation, and/or property as defined by Section 21303(d) of Part 213, Leaking Underground Storage Tanks, of the NREPA. Pursuant to Sections 20126(1)(c) and 21323a(1)(b), the conditions of this exemption require the legal entity to disclose the BEA to a subsequent purchaser or transferee of the property.

The BEA is only for the legal entity and property identified in the BEA and on the BEA Submittal Form. Each new legal entity that becomes the owner or operator of this facility must submit their own BEA.

The MDEQ is not making any findings about the adequacy of the submittal or whether the submitter is liable or is eligible to submit. The submitted BEA does not alter liability with regard to a subsequent release, threat of release, or exacerbation of existing conditions that is the responsibility of the legal entity submitting the BEA.

The legal entity, as the owner and/or operator of a facility or property, may have Due Care responsibilities under Section 20107a of Part 201, Environmental Remediation, and/or Section 21304c of Part 213, Leaking Underground Storage Tanks, of the NREPA.

The legal entity may also have responsibility under applicable state and federal laws, including, but not limited to, Part 201, Environmental Remediation; Part 111, Hazardous Waste Management; Part 211, Underground Storage Tank Regulations; Part 213, Leaking Underground Storage Tanks; Part 615, Supervisor of Wells, of the NREPA; and the Michigan Fire Prevention Code, 1941 PA 207, as amended.

Pursuant to Section 20112a(6) of Part 201, Environmental Remediation, the property(s) identified in the BEA will be placed on the inventory of facilities, which is updated daily and posted on the MDEQ's website: https://secure1.state.mi.us/FacilitiesInventoryQueries.

Authorized signature:

Dennis Eagle, District Supervisor
Lansing District Office
Remediation and Redevelopment Division
Michigan Department of Environmental Quality
525 West Allegan Street
P.O. Box 30242
Lansing, Michigan 48909
517-614-8544
eagled@michigan.gov

Enclosure
cc: Environmental Consulting & Technology Inc.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY – REMEDIATION AND REDEVELOPMENT DIVISION, PO BOX 30426, LANSING, MICHIGAN 48909-7926, Phone 517-373-9837, Fax 517-373-2637

FOR DEQ USE ONLY
BEA SUBMITTAL #
BA018025001A

Baseline Environmental Assessment Submittal Form

This form is for submittal of a Baseline Environmental Assessment (BEA), as defined by Part 201, Environmental Remediation and Part 213, Leaking Underground Storage Tanks, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, for the purpose of establishing an exemption to liability pursuant to Section 20126(1)(c) and Section 21323a(1)(b) for a new owner or operator of property that is a facility as defined by Section 20101(1)(s) or Property as defined by Section 21303(d). The BEA report must be conducted either prior to or within 45 days after becoming the owner or operator, whichever is earliest. This form and the BEA report must be submitted prior to or within 6 months of becoming the owner or operator whichever is earliest. A separate BEA is required for each legal entity that is or will be a new owner or operator of the property. To maintain the exemption to liability, the owner and operator must also disclose the BEA to any subsequent purchaser or transferee before conveying interest in the property pursuant to Section 20126(1)(c) and Section 21323a(1)(b). An owner or operator of a facility or Property also has due care obligations under Section 20107a and Section 21304c with respect to any existing contamination to prevent unacceptable exposure; prevent exacerbation; take reasonable precautions; provide reasonable cooperation, assistance, and access to authorized persons taking response activities at the property; comply with land use restrictions associated with response activities; and not impede the effectiveness of response activities implemented at the property. Documentation of due care evaluations, all conducted response activities, and compliance with 7a or 4c need to be available to the MDEQ, but not submitted, within 8 months of becoming the owner or operator of a facility and/or Property.

Section A: Legal Entity Information

Name of legal entity that does or will own or operate the property: **James P Cole Venture, LLC**

Address: **27 Forest Lane**

City: **South Barrington** State: **IL** ZIP: **60010**

Contact Person (Name & Title): **Ms. Ramona Navitsky - Treasurer**
Telephone: **(312) 543-1250**
Email: **mona.navitsky@dearcapcre.com**

Contact for BEA questions if different from submitter:
Name & Title: **Mr. John D'Addona – Principal Engineer**

Company: **Environmental Consulting & Technology, Inc.**

Address: **2200 Commonwealth Blvd., Suite 300**

City: **Ann Arbor** State: **MI** ZIP: **48105**

Telephone: **(734) 769-3004** Email: **jdaddona@ectinc.com**

Section B: Property Information

Street Address of Property: **1809 James P Cole Blvd**
City: **Flint** State: **MI** Zip: **48503**
City/Village/Township: **City of Flint**

Property Tax ID (include all applicable IDs):
41-06-452-014 & 41-06-452-015

Address according to tax records, if different than above (include all applicable addresses):

City:_____ State:___ Zip:_____

Status of submitter relative to the property (check all that apply):

	Former	Current	Prospective
Owner	☐	☐	☒
Operator	☐	☐	☒

County: **Genesee**

Town: **7 North** Range: **7 East** Section: **6 and 7**
Quarter: Quarter-Quarter:

Decimal Degrees Latitude: **43.0324828**
Decimal Degrees Longitude: **83.684671**

Reference point for latitude and longitude:
Center of site ☒ Main/front door ☐
Front gate/main entrance ☐ Other ☐

Collection method:
Survey ☐ GPS ☒ Interpolation

Section C: Source of contamination at the property (check all that are known to apply):

Facility regulated pursuant to Part 201, other source, or source unknown ☐
Part 201 Site ID, if known: _____

Property - Leaking Underground Storage Tank regulated pursuant to Part 213 ☐
Part 211/213 Facility ID, if known: _____

Oil or gas production and development regulated pursuant to Part 615 or 625 ☐

Licensed landfill regulated pursuant to Part 115 ☐

Licensed hazardous waste treatment, storage, or disposal facility regulated pursuant to Part 111 ☐

RECEIVED
SEP 13 2018
MDEQ - RRD
LANSING DISTRICT OFFICE

Section D: Applicable Dates (provide date for all that are relevant):

	MM/DD/YYYY
Date All Appropriate Inquiry (AAI) Report or Phase I Environmental Assessment Report completed:	07/11/2018
Date Baseline Environmental Assessment Report conducted:	09/10/2018
Date submitter first became the owner:	09/14/2018

Date submitter first became the operator:	09/14/2018
Date submitter first became the operator (if prior to ownership):	N/A
Anticipated date of becoming the owner for prospective owners:	N/A
Anticipated date of becoming the operator for prospective operators:	N/A
If former owner or operator of this property, prior dates of being the owner or operator:	N/A

Section E: Check the appropriate response to each of the following questions:	YES	NO
1 Is the property at which the BEA was conducted a "facility" as defined by Section 20101(1)(s) or a Property as defined by Section 21303(d)?	☒	☐
2 Was the All Appropriate Inquiry (AAI) completed in accordance with Section 20101(1)(f) and or 21302(1)(b)?	☒	☐
3 Was the BEA, including the sampling, conducted either prior to or within 45 days of the date of becoming the owner, operator, or of foreclosure, whichever is earliest?	☒	☐
4 Is this BEA being submitted to the department within 6 months of the submitter first becoming the owner or operator, or foreclosing?	☒	☐
5 Does the BEA provide sufficient rationale to demonstrate that the data is reliable and relevant to define conditions at the property at the time of purchase, occupancy, or foreclosure, even if the BEA relies on studies of data prepared by others or conducted for other purposes?	☒	☐
6 Does this BEA contain the legal description of the property addressed by the BEA?	☒	☐
7 Does this BEA contain the environmental analytical results, a scaled map showing the sample locations, and the basis for the determination that the property is a facility as defined by Section 20101(1)(s) or the basis for the determination that the property is a Property as defined by Section 21303(d)?	☒	☐

Section F: Environmental Consultant Signature:

I certify to the best of my knowledge and belief, that this BEA and all related materials are true, accurate, and complete. I certify that the property is a facility as defined by Section 20101(1)(s) or a Property as defined by Section 21303(d) and have provided the sampling and analyses that support that determination. I certify that any exceptions to, or deletions from, the All Appropriate Inquiry Rule are described in Section 1 of the BEA report.

Signature: _____ Date: September 10, 2018

Printed Name: **John D'Addona, P.E.**

Company: **Environmental Consulting & Technology, Inc.**

Mailing Address: **2200 Commonwealth, Suite 300** City: **Ann Arbor** State: **MI** Zip: **48105**

Telephone: **(734) 769-3004** E-Mail **jdaddona@ectinc.com**

Section G: Legal Entity Signature:

With my signature below, I certify that to the best of my knowledge and belief, this BEA and all related materials are true, accurate, and complete.

Signature: Ramona Navitsky Date: September 7, 2018

(Person legally authorized to bind the legal entity)

Printed Name: **Ms. Ramona Navitsky**

Title and Relationship of signatory to submitter: **Treasurer**

Address: **27 Forest Lane** City: **South Barrington** State: **IL** Zip: **60010**

Telephone: **(312) 543-1250** E-Mail: **mona.navitsky@dearcapcre.com**

Submit the BEA report and this form to the MDEQ District Office for the county in which the property is located. An office map is located at www.michigan.gov/deqrrd.

ECT Environmental Consulting & Technology, Inc.
2200 Commonwealth Blvd., Suite 300, Ann Arbor, Michigan 48105

BASELINE ENVIRONMENTAL ASSESSMENT

Parcels 41-06-452-014 & 41-06-452-015
JAMES P. COLE BOULEVARD
FLINT, MICHIGAN 48503

For submission to:
Michigan Department of Environmental Quality
Remediation and Redevelopment Division
Lansing District Office
525 West Allegan Street
P.O. Box 30242
Lansing, Michigan 48909

September 10, 2018
ECT No. 180509-0100

Document Review

The dual signatory process is an integral part of Environmental Consulting & Technology, Inc.'s (ECT's) Document Review Policy No. 9.03. All ECT documents undergo technical/peer review prior to dispatching these documents to any outside entity.

This document has been authored and reviewed by the following employees:

Ryan Higuchi	John D'Addona, P.E.
Author	Peer Review
Signature	Signature
September 10, 2018	September 10, 2018
Date	Date

Table of Contents

TABLES

FIGURES

APPENDICES

List of Acronyms

AAI	All Appropriate Inquiry
AKT	AKT-Peerless
AMEC	AMEC Environment & Infrastructure, Inc.
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
BEA	Baseline Environmental Assessment
BGS	Below Ground Surface
CAS	Chemical Abstract Service Number
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
COC	Chain of Custody
CREC	Controlled Recognized Environmental Condition
DC	Direct Contact
ECT	Environmental Consulting & Technology, Inc.
EDR	Environmental Data Resources, Inc.
EP	Environmental Professional
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
FINDS	Facility Index System/Facility Registry System
GRCC	Generic Residential Cleanup Criteria
GSI	Groundwater Surface Water Interface
HREC	Historical Recognized Environmental Condition
JPCV	James P. Cole Ventures, LLC
MDEQ	Michigan Department of Environmental Quality
NonGen	Non-generator
NREPA	Natural Resources and Environmental Protection Act
LUST	Leaking Underground Storage Tank
PCB	Polychlorinated biphenyls
PNA	Polynuclear aromatics
PID	Photoionization Detector
PPM	Parts per Million
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
SVIAI	Soil Volatilization to Indoor Air Inhalation
SVOC	Semi-volatile Organic Compounds
SWDBG	State-wide Default Background
SWF/LF	Solid Waste Facilities/Landfill
USCS	Unified Soil Classification System
USGS	United States Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compounds
WDS	Waste Data System

1.0 Introduction and Discussion

This Baseline Environmental Assessment (BEA), as defined by the Environmental Remediation, Part 201 of the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451, as amended, and the Part 201 Rules promulgated thereunder, has been completed by Environmental Consulting & Technology, Inc. (ECT) on behalf of James P. Cole Venture, LLC (JPCV), for the approximately 17.99-acre property comprised of two (2) parcels of 16.09 acres (Parcel A) located at 1809 James P. Cole Boulevard, and 1.90 acres (Parcel B) located at James P. Cole Boulevard in Flint, Michigan 48503 (herein referred to as the Subject Property). This BEA has been completed pursuant to Section 20126(1)(c) of Part 201 of NREPA PA 451 of 1994, as amended (Part 201).

In conducting this BEA, ECT has considered the results of a historical property use review and a physical reconnaissance performed in general conformance with the scope and limitation of American Society for Testing and Materials (ASTM) Practice E 1527-13. ECT has also obtained and reviewed data from sampling and analytical testing to adequately describe the environmental conditions that exist at the Subject Property at the time of the acquisition by the Submitter.

1.1 Owner/Operator Information

The purchaser of the Subject Property and Submitter of this BEA is James P. Cole Venture, LLC.

1.2 Intended Use of Property

The Submitter intends to redevelop the Subject Property consistent with local zoning and land-use ordinances. Operations on the Subject Property will not require the use of hazardous substances in a manner that would be considered a significant hazardous substance use as defined in Rule 901(o). This is the basis for being able to distinguish the existing contamination from any future release of a hazardous substance on the Subject Property.

1.3 Executive Summary of AAI

On July 11, 2018, AKT-Peerless (AKT), on behalf of JPCV, completed a Phase I ESA in general conformance with the scope and limitations of ASTM Practice E 1527-13 for the Subject Property. The Phase I ESA identified five (5) recognized environmental conditions (RECs) in connection with the Subject Property which are as follows:

REC 1 - *"The subject property operated for industrial purposes from 1901 until 1996, specifically as a varnish and spring manufacturer from 1901 until the early 1920s, and then as DuPont from the early 1920s until 1996. Operations on the subject property included the use and/or storage of heavy industrial equipment, various chemicals, various petroleum products, hazardous substances, and/or hazardous wastes.*

Moreover, the subject property was identified on the Waste Data System (WDS) database, the Resource Conservation & Recovery Act - Corrective Action Facilities (RCRAC) database, the Resource Conservation and Recovery Act –Generator Facilities (RCRAGR05) database, the Resource Conservation & Recovery Act Sites with Controls (RCRASC) database, the Resource Conservation & Recovery Act - Non-CORRACTS Treatment, Storage & Disposal Facilities (RCRAT)

database, the Baseline Environmental Assessment (BEA) database, the Biennial Reporting System (BRS) database, the Enforcement and Compliance History Online (ECHOR05) database, the Facility Registration System (FRSMI) database, the Institutional and Engineering Controls Registry (ICEC) database, the Inventory of Facilities (IF) database, Registered Underground Storage Tank (RUST), the Registered Aboveground Storage Tank (RAST) database, the Leaking Underground Storage Tank (LUST) database, and the Toxics Release Inventory (TRI) database.

According to the RUST database, seven USTs were removed from the ground. Additionally, MDEQ RRD file documentation confirmed a release (C-0226-89) of an unknown substance on June 5, 1989. The confirmed release was granted "closure" by the MDEQ on October 13, 1998. The results of subsurface investigations conducted between 1989 and 2015 identified soil and groundwater contamination at the subject property. Several compounds including benzene, ethylbenzene, 1,2,4-trimethylbenzene isomers, xylenes, benzo(g,h,i)perylene, fluoranthene, indo(1,2,3-cd)pyrene, arsenic, chromium, cobalt, and cyanide were identified in on-site soil and groundwater samples exceeding the current MDEQ Part 201 residential cleanup criteria (RCC).

Based on laboratory analytical results, the subject property meets the definition of a facility, as defined in Part 201 of the NREPA, Michigan Public Act (PA) 451, 1994, as amended. A BEA was subsequently disclosed to the MDEQ based upon the facility designation. In AKT Peerless' opinion, the historical use of the subject property and the presence of known contamination at the subject property represent a REC.

Multiple subsurface investigations were conducted on the subject property between 1989 and 2015 to address previously identified environmental concerns. It is AKT Peerless' opinion, the recognized environmental concerns discussed above have been adequately evaluated and no further subsurface investigation activities are recommended at this time. However, as noted previously, the subject property meets the definition of a facility, as defined in Part 201 of the NREPA, Michigan PA 451, 1994, as amended. Therefore, AKT Peerless recommends any future owner(s)/operator(s) prepare a BEA report and conduct a Section 20107(a) Documentation of Due Care Compliance (DDCC) Analysis prior to future use and occupancy."

REC 2 - *"The northern adjoining property (902 E Hamilton Avenue) historically operated for industrial purposes since at least 1914 until at least 1999. This adjoining property was identified on the Inventory of Facilities (IF) database and the PART 201 database. This adjoining property was also identified on the RUST database with 94 USTs, in which 90 have been removed and 4 are currently in use. This adjoining property was identified on the LUST database with 18 releases, of which 12 are currently listed as "open" by the MDEQ. In AKT Peerless' opinion, the known contamination related to the historical uses of the northern adjoining property and the 12 open releases represents a REC."*

REC 3 - *"The southwestern adjoining property (1513 St John Street, historically 1517 St John Street) operated as an automotive repair shop since at least 1928 until at least 1967. This adjoining property was identified on the WDS database and the RUST database with one UST, which was removed on January 19, 1999. Additionally, MDEQ RRD file documentation confirmed a release (C-0047-99) of an unknown substance on January 19, 1999. The confirmed release was granted "closure" by the MDEQ on May 16, 1999. In AKT Peerless' opinion, the historical uses of the southwestern adjoining property and historical release represents a REC."*

REC 4 - *"The western adjoining property (1620 Industrial Avenue) is currently being utilized for the storage of demolition debris. This adjoining property has historically operated for industrial purposes since at least 1902 until at least 1999. This adjoining property was identified on the IF database, the PART 201 database, and the BEA database. Additionally, MDEQ RRD file documentation confirmed a release (C-0146-85) of an unknown substance on June 2, 1987. The confirmed release remains "open" with the MDEQ. In AKT Peerless' opinion, the current use of the western adjoining property, the known contamination related to the historical uses of this adjoining property, and the open release represents a REC."*

REC 5 - *"The western adjoining property (1002 E Hamilton Avenue) has historically operated for industrial purposes since at least 1902 until at least 1999. This adjoining property was identified on the IF database with a BEA. In AKT Peerless' opinion, that the known contamination related to the historical uses of this adjoining property represents a REC."*

Based on these findings, AKT recommended further site investigation and/or assessment for RECs 2 through 5 in order to evaluate potential contaminant migration onto the Subject Property.

The Phase I ESA also identified a Controlled Recognized Condition (CREC) in connection to the Subject Property pertaining to the following:

> **CREC 1** - *"According to information obtained from a review of Michigan Department of Environmental Quality, (MDEQ) file information, a restrictive covenant was set in place for two locations on Parcel A of the Subject Property dated May 29, 2009. The restrictive covenant includes a land use restriction that prohibits the use of the two areas of the subject property that are not in compliance with the limited or site-specific land use category; it also prohibits groundwater use for any purposes, except for wells and devices that are part of an MDEQ-approved response activity. With these considerations, contamination will remain on site at concentrations that exceeds the MDEQ, Part 201/213 (1994 P.A 451) Residential Risk Based Screening Levels. Consequently, the subject property is a "facility" as that term as defined in Part 201."*

A copy of AKT's Phase I ESA is attached hereto as **Appendix A.**

The Submitter is unaware of any abandoned or discarded containers currently present on the Subject Property. Therefore, form EQP4476 is not required as part of this BEA.

1.4 Exceptions or Deletions from AAI Rule

The Phase I ESA included a review of current plat maps, historical plat maps, city directories, aerial photographs, topographic maps, property deeds, tax assessor's records, building permits, environmental reports, historical sources, and personal interviews conducted with individuals and public officials having knowledge of the Subject Property. A systematic review of environmental databases maintained by state and federal government agencies was also performed as required and defined by ASTM Practice E 1527-13. Accordingly, while ECT is unaware of any limitations or exceptions from the standard practice, it recognizes inherent limitations for Phase I ESAs in general, including but not limited to the elimination of uncertainty, non-exhaustive assessment and variable level of inquiry. Readers of this BEA are directed to Section 1.3 of AKT's Phase I ESA for an explanation of these limitations (**Appendix A**).

1.5 Discussion of Data Gaps

In accordance with ASTM Practice E 1527-13, the identification of data gaps, as well as comments on their significance on the ability to identify RECs for the Subject Property is required. As stated in Section 9.0 of the Phase I ESA, AKT identified the following deviations or "significant" data gaps, as defined by §312.10 of AAI final rule and §12.7 of ASTM E1527-13 for the Subject Property:

- *"Due to data failure, AKT Peerless was unable to determine the past development or use of the subject property prior to 1898 after review of reasonably ascertainable historical sources. AKT Peerless considers this to be a significant data gap (as defined by ASTM Practice E 1527) which may have impacted AKT Peerless' ability to identify RECs in connection with the subject property."*

1.6 Previous Baseline Environmental Assessments

ECT is aware of two (2) previous BEAs that were prepared for the Subject Property. A summary of the data collected in support of these BEAs are as follows:

AMEC Environmental & Infrastructure – February 2013
A BEA was prepared and filed by AMEC Environment & Infrastructure, Inc. (AMEC) on behalf of the Mullins Land Company, LLC in February 2013. The BEA was completed based on the identification of seven (7) RECs from a prior Phase I ESA dated January 2013 that was completed by AMEC. These RECs included:

- The historical use of the subject property for manufacturing of varnishes, paints, and adhesives,
- The historical environmental database listings,
- The presence of an operating groundwater treatment system designed to recover light non-aqueous phase liquid (LNAPL) and contaminated groundwater,
- The recorded deed restriction,
- The historical presence of a railroad west of the subject property,
- The historical presence of automobile component factories and bulk petroleum storage facilities on the western adjoining property, and
- The historical presence of automobile component factories and documented releases on the northern adjoining properties.

As noted by AMEC, DuPont conducted several remedial investigations at the Subject Property that included the advancement of over 150 soil borings, the excavation of approximately 20 test pits, over 40 groundwater monitoring well installations, and the collection of soil and groundwater samples for laboratory analysis. AMEC compared soil and groundwater results to the MDEQ Part 201 Residential Cleanup Criteria (RCC). Soil and groundwater exceedances of these criteria were primarily located in the vicinity of Building 6 and a former UST area, located at the southeast property boundary. Based on these historical analytical testing results, DuPont reportedly excavated and disposed of all contaminated soil above the saturated zone that exceeded the MDEQ's Part 201 industrial direct contact criteria. A groundwater treatment system was also installed around the exterior of Subject Building 6, and two land and resource use restrictions areas were filed for the Subject Property.

Applied Science, Inc. – September 2016
A BEA was prepared and filed by Applied Science, Inc. on behalf of C3 PH, LLC in September 2016. Applied Science noted that DuPont entered into a Voluntary Corrective Action agreement with MDEQ that included the excavation of soil impacted above the MDEQ non-residential direct contact cleanup criteria, as well as the operation of a groundwater treatment system designed to remove contaminated groundwater and free product. In 2015, DuPont requested a no further action status with regard to the free product recovery with respect to the absence of free product for a period of 12 consecutive months.

Contamination was still noted on the Subject Property in soil and groundwater above the MDEQ Part 201 Residential Cleanup Criteria (RCC) for VOCs, SVOCs, arsenic, chromium, cobalt, and cyanide, therefore Applied Science concluded that the Subject Property met the definition of a facility as defined in Part 201 of NREPA, Michigan Public Act 451, 1994, as amended.

1.7 Discussion of Environmental Sampling

AKT's Phase I report identifies a recognized environmental condition pertaining to the Subject Property's prior uses which involved use and/or storage of heavy industrial equipment, various chemicals, various petroleum products, hazardous substances, and/or hazardous wastes. A number of investigations between 1989 and 2015 identified soil and groundwater contaminant concentrations that exceeded generic residential cleanup criteria thereby characterizing the Subject Property as a *facility* as defined in Part 201 of NREPA, Michigan Public Act 451, 1994, as amended. Based on the comprehensive sample results, no further subsurface sampling of known on-site contaminant areas were completed for this BEA.

As a result of the findings in the Phase I ESA, ECT performed a Phase II environmental site investigation on August 20, 2018, on behalf of the Submitter for the purpose of evaluating the potential contamination from offsite sources on the Subject Property prior to its acquisition. Specifically, the following evaluation activities were completed:

1.7.1 Soil Sampling

Direct push drilling services were performed by Fibertec Environmental Services, Inc. (Fibertec) using a track-mounted Geoprobe® Model 6620 drilling rig. The final depths of the borings were determined in the field based on observed subsurface soil conditions, the potential migration pathways associated with the RECs, and the depth to groundwater. Six (6) soil borings, designated as GP-1 through GP-6, were completed to depths of 15 feet below ground surface (bgs), except at boring GP-6 where the boring was advanced to a depth of 10 feet bgs. Soil characteristics at each boring were described and logged by a field geologist in general accordance with the Unified Soil Classification System (USCS) and screened for ionizable volatile organic compounds (VOCs) using a MiniRae 3000 photoionization detector (PID) equipped with a 10.6 electron volt (eV) lamp. The PID had a minimum detection limit of 0.1 parts per million (ppm) and was calibrated daily prior to usage. The locations of the soil borings are depicted on **Figure 3.**

Soil borings GP-1, GP-2, GP-5, and GP-6 were located in areas where the construction of new buildings is proposed. For each of these locations, one (1) discrete soil sample was collected for laboratory analytical testing. The soil samples were collected within ten feet below the ground surface based on elevated PID screening results. If there were negligible differences in PID screening results through the soil column, a sample was collected based on soil types or visual observations or at the bottom of the 10-foot interval. Soil descriptions, sample collection intervals, and PID readings are shown on the soil boring logs provided in **Appendix B.** Soil samples selected for laboratory analyses were placed in an ice-filled cooler for transportation to Fibertec's analytical laboratory. All four (4) of the soil samples were analyzed for VOCs, polynuclear aromatics (PNAs), and 10-MI metals as described below in Section 1.7.3. The soil sampling locations are shown on **Figure 3.**

1.7.2 Groundwater Sampling

Groundwater samples were collected to evaluate the potential for the migration of contamination from an off-site source onto the Subject Property. Shallow groundwater samples were collected from temporary monitoring wells TMW-1 through TMW-6, located at soil borings GP-1 through GP-6, respectively. Groundwater was observed in all six (6) soil borings within the maximum explored depth of 15 feet. Temporary monitoring wells were installed using one-inch disposable polyvinyl chloride (PVC) monitoring wells with 10-slot five-foot screens. The depths of the temporary monitoring wells ranged from 9 to 15 feet bgs, depending on the presence of water-bearing soils observed at the soil boring. Groundwater samples were collected from five of the six temporary monitoring wells. TMW-4, located at GP-4, had insufficient groundwater to produce a groundwater sample. The screened depths of the temporary monitoring wells are included on the soil boring logs provided in **Appendix B.**

Groundwater samples were also collected from existing monitoring wells. Shallow groundwater samples were collected from MW-23S, MW-24S, MW-25S, and MW-26S with depths ranging from 6.6 to 12 feet. Deep groundwater samples were collected from MW-23D, MW-24D, MW-25D, and MW-26D with depths ranging from 68 to 89 feet. Five (5) groundwater samples from temporary monitoring wells (TMW-1, TMW-2, TMW-3, TMW-5, and TMW-6) and three (3) groundwater samples from the existing, deep monitoring wells (MW-23D, MW-24D, and MW-26D) were submitted for analysis for VOCs, PNAs, and 10-MI metals as described below in Section 1.7.3. PCBs were additionally requested for analysis at TMW-1 and MW-24D. Groundwater samples collected for laboratory analyses were placed in an ice-filled cooler for transportation to Fibertec's analytical laboratory. Samples collected from MW-23S, MW-24S, MW-25S, and MW-26S were not submitted for laboratory testing due to the lack of visual and olfactory evidence of contamination. The temporary and existing monitoring well locations are included on **Figure 3.**

1.7.3 Location of Known Contamination

Soil

A table comparing the results of the soil analytical testing to the current Part 201 Generic Residential Cleanup Criteria (GRCC) is included in **Table 1**. The soil sampling locations are shown on **Figure 3.** The analytical laboratory testing reports are included in **Appendix C**. Based on observed soil conditions and a review of the analytical testing results, ECT concluded the following:

- No VOCs were detected in the four (4) soil samples. The samples were collected to evaluate shallow contamination.

- No PNAs were detected in the four soil samples. The samples were collected to evaluate for shallow contamination.

- Metals were detected above laboratory reporting limits in all soil samples (from soil borings GP-1 through GP-4). The samples were collected to evaluate for shallow contamination in the vicinity of proposed buildings. A concentration of arsenic exceeds the state-wide default background (SWDBG), drinking water protection, groundwater surface water interface (GSI) protection, and residential direct contact. Concentrations of total chromium and selenium exceeds the SWDBG and the GSI protection. The concentration of mercury exceeds the GSI protection criterion, but not the SWDBG. Concentrations of barium, cadmium, copper, lead, silver, and zinc did not exceed their respective SWDBG or criteria. Concentrations of metals that exceed the residential criteria limit are discussed below.
    - Arsenic was detected in every sample at concentrations ranging from 1,400 to 9,900 µg/kg. The concentration of arsenic at GP-2 (3-5') exceeds the SWDBG value (5,800 µg/kg), the DW protection (4,600 µg/kg), the GSI (4,600 µg/kg) protection, and the residential direct contact (7,600 ug/kg) cleanup criteria. Under the Part 201 rules, background values for metals may be substituted for GRCC if the background concentrations are higher than the cleanup criteria. The arsenic concentration is above the SWDBG value, but it is below region-specific background values as presented in the Michigan Department of Environmental Quality (MDEQ) *Michigan Background Soil Survey 2005 (Updated 2015).* MDEQ has begun accepting these regional soil background values based on the empirical average regional background concentration plus two standard deviations. Therefore, the acceptable background value for arsenic in clay soils within the Erie Glacial Lobe is 31,400 µg/kg. Substituting this value for GRCC results in arsenic concentrations not exceeding GRCC.
    - Chromium was detected in all soil samples at concentrations ranging from 4,000 to 27,000 µg/kg. The concentration of chromium collected from GP-1 (3-5') exceeds the SWDBG (18,000 µg/kg) and GSI protection (3,300 µg/kg) criterion. Due to a higher acute toxicity for hexavalent chromium (Cr(VI)) compared to the more commonly occurring trivalent chromium Cr(III)), the Part 201 GRCC for chromium are based on the risks associated with Cr(VI). No Part 201 GRCC are established for Cr(III), but there is a SWDBG level for Cr(III) that is set at 18,000 µg/kg. The laboratory analyses performed for the soil samples represents a total chromium concentration, and does not differentiate between Cr(III) and Cr(VI). Unless additional analyses are performed to specifically test for Cr(VI), the conservative approach is to compare the reported concentrations to the Part 201 Cr(VI) GRCC and the Cr(III) background values.
    - Selenium was detected in two (2) soil samples at concentrations ranging from 240 to 630 µg/kg. The concentration of selenium collected from GP-2 (3-5') exceeds the SWDBG (410 µg/kg) and the GSI protection (400 µg/kg) cleanup criteria.
      The concentrations of arsenic, chromium, and selenium at GP-1 and GP-2 exceed their respective residential criteria.

Groundwater

A table comparing the results of the groundwater analytical testing to the current Part 201 Generic Residential Cleanup Criteria (GRCC) is included in **Table 2**. The soil sampling locations are shown on **Figure 3.**

The analytical laboratory testing reports are included in **Appendix C.** Based on observed groundwater conditions and a review of the analytical testing results, ECT concluded the following:

- Several VOCs were detected in four groundwater samples: TMW-1, TMW-2, TMW-3, and TMW-5. The samples were collected to evaluate for potential contaminant migration onto the subject property. Benzene was detected in two groundwater samples (TMW-1 and TMW-5) at concentrations ranging from 1.2 to 180 µg/L. The concentrations of benzene at TMW-1 exceed the drinking water protection (5.0 µg/L) and GSI protection (12 µg/L) criteria. Isopropylbenzene was detected in one groundwater sample, TMW-1, at a concentration of 32 ug/L. The concentration of isopropylbenzene exceeds the GSI protection (28 µg/L) criterion. Naphthalene (also discussed under PNAs) was detected in one groundwater sample at a concentration of 39 ug/L. The concentration of naphthalene collected from TMW-1 exceeds the GSI protection (11 µg/L) criterion. Trichloroethene was detected in one groundwater samples at a concentration of 5.3 ug/L. The concentration of trichloroethene collected from TMW-3 exceeds the drinking water protection (5.0 µg/L) criterion. Xylenes were detected in one groundwater sample at a concentration of 60 µg/L. The concentration of xylenes collected from TMW-1 exceeds the GSI protection (41 µg/L) criterion. The concentrations of benzene, isopropylbenzene, naphthalene, trichloroethene, and xylenes in two groundwater samples exceed their respective GRCC. Acetone, sec-butylbenzene, ethylbenzene, n-propylbenzene, toluene, trichlorofluoromethane, 1,2,4-trimethylbenzene (TMB), and 1,3,5-TMB were detected, but the concentrations were below their respective cleanup criteria.

- PNAs were detected in one groundwater sample: TMW-1. Samples were collected to evaluate for potential contaminant migration onto the subject property. Naphthalene (also discussed under VOCs) was detected in one groundwater sample at a concentration of 39 ug/L. The concentration of naphthalene collected from TMW-1 exceeds the GSI protection (11 µg/L) criterion. The concentration of naphthalene in one groundwater sample exceeds the respective residential cleanup criteria. There were no other detections of PNAs.

- Metals were detected above laboratory reporting limits in all groundwater samples, except TMW-1. The samples were collected to evaluate for potential contaminant migration onto the subject property. Concentrations of arsenic, cadmium, and lead exceed the drinking water and GSI criteria. Concentrations of copper exceed the GSI criterion. Concentrations of metals that exceed the residential criteria limit are discussed below.

    - Arsenic was detected in two groundwater samples (TMW-2 and TMW-5) at concentrations ranging from 18 to 25 µg/L. The concentrations exceed the DW (10 µg/L) and the GSI (10 µg/L) criteria.
    - Cadmium was detected in two groundwater samples (MW-23D and MW-26D) at concentrations ranging from 11 to 51 µg/L. The concentrations exceed the DW (5.0 µg/L) and the GSI (2.5 µg/L) criteria.
    - Copper was detected in eight groundwater samples at concentrations ranging from 5.0 to 32 µg/L. The concentrations of copper collected from TMW-2 and TMW-3 exceed the GSI (13 µg/L) criteria.
    - Lead was detected in three groundwater samples at concentrations ranging from 3.0 to 20 µg/L. The concentrations of lead collected from TMW-2 and TMW-3 exceed the DW (4.0 µg/L) and the GSI (14 µg/L) criteria.
    - The concentrations of arsenic, cadmium, copper, and lead exceed their respective residential criteria.

- PCBs were not detected in the two groundwater samples (TMW-1 and MW-24D), which were collected to evaluate for potential contaminant migration onto the Subject Property.

In determining the sample locations and analytical testing parameters described herein, ECT relied upon its best judgment of the hazardous substances most likely to be present with respect to the prior uses of the adjacent properties. Readers should note that the presence of all possible contaminants has neither been confirmed as a part of this assessment, nor is such confirmation a required element of this BEA.

1.7.4 Basis for Concluding Facility Status

A comparison of analytical data obtained as a result of ECT's August 2018 sampling of areas of the Subject Property potentially affected by the migration of contaminants by off-site sources indicates the presence of VOCs, SVOCs and Michigan 10 Metals within the groundwater, and Michigan 10 Metals at concentrations exceeding levels exceeding the corresponding GRCC established for residential uses under the NREPA, 1994 PA 451, as amended. In addition, contamination remains on the Subject Property in both soil and groundwater above the GRCC for VOCs, SVOCs, arsenic, chromium, cobalt, and cyanide as detailed in the BEA report that was prepared by Applied Science, Inc. in September 2016. Accordingly, the Subject Property described herein meets the definition of a "facility" under Part 201 of the NREPA.

2.0 Property Information

2.1 Legal Description

The Subject Property is located on the southwest corner of East Hamilton Avenue and James P. Cole Boulevard, north of East Wood Street in the City of Flint. Parcel A is located at 1809 James P. Cole Boulevard while Parcel B has no address number on James P. Cole Boulevard, Sections 6 and 7, Township 7 North, and Range 7 East of the Flint North Quadrangle Map, in Flint, Genesee County, Michigan 48503. The Parcel ID (Tax ID) numbers for the Subject Property are:

Parcel A – (Parcel ID: 41-06-452-014)
THAT PART OF BLKS 29, 30, 31, 32, 33 AND 34 OF OAK PARK SUBDIVISION OF PART OF SECS 1 & 2 OF SMITH'S RESERVATION AND PT OF VACATED ST JOHN ST AND OTHER VACATED STREETS AND PT OF LOTS 1 THRU 15, 19 AND 24 THRU 29 AND INCL ALL OF LOTS 16 THRU 18 AND 20 THRU 23 OF PLAT OF FLANDERS & HOURANS SUBDIVISION AND PT OF THE OLD RR ROW AND OTHER LANDS DESC AS: COM AT THE SW COR OF LOT 25 OF SD PLAT OF FLANDERS & HOURANS SUBDIVISION; TH N 24 DEG 13' 00" E ALG THE ELY ROW LINE OF ST JOHN ST, 211.50 FT; TH N 65 DEG 47' 00" W, 2.35 FT; TH N 64 DEG 31' 55" W, 158.28 FT; TH S 40 DEG 14' 11 E, 1.25 FT; TH N 72 DEG 44' 20" W, 19.17 FT; TH N 17 DEG 08' 12" E, 154.66 FT; TH N 20 DEG 09' 39" E, 288.13 FT; TH N 19 DEG 17' 08" E, 35.22 FT TO POB OF THIS PARCEL OF LAND; TH CONT N 19 DEG 17' 08" E, 101.73 FT; TH N 22 DEG 04' 49" E, 50.04 FT; TH N 23 DEG 58' 29" E, 150.06 FT; TH N 20 DEG 22' 22" E, 110.76 FT; TH N 18 DEG 10' 21" E, 240.78 FT; TH ALG THE ARC OF A CURVE TO THE RIGHT WITH RADIUS OF 1128.83 FT, A DIST OF 144.58 FT, THE LONG CHORD BEARING N 21 DEG 50' 20" E, 144.48 FT; TH N 65 DEG 35' 31" W, 18.63 FT; TH N 14 DEG 02' 16" E, 175.59 FT; TH N 15 DEG 44' 18" E, 271.61 FT; TH N 78 DEG 57' 09" W, 23.05 FT; TH N 11 DEG 47' 00" E, 98.38 FT; TH N 67 DEG 01' 34" W, 0.61 FT; TH N 12 DEG 12' 29" E, 165.28 FT TO A FOUND PT ON THE SLY LINE OF HAMILTON AVE; TH ALG SD HAMILTON AVE AS MONUMENTED, S 89 DEG 06' 53" E, 62.00 FT; TH S 89 DEG 47' 46" E, 33.97 FT TO THE PC OF A NON-TANGET CURVE TO THE RIGHT, WITH RADIUS OF 597.53 FT; TH ALG THE ARC OF SD CURVE A DIST OF 60.67 FT, THE LONG CHORD BEING S 74 DEG 59' 40" E, 60.64 FT TO THE PC OF A COMPOUND NON-TANGENT CURVE TO THE RIGHT WITH RADIUS OF 45 FT; TH ALG THE ARC OF SD CURVE A DIST OF 31.86 FT, THE LONG CHORD BEING S 51 DEG 48' 10" E, 31.20 FT TO THE PC OF A COMPOUND NON-TANGENT CURVE TO THE RIGHT WITH RADIUS OF 587.53 FT; TH ALG THE ARC OF SD CURVE A DIST OF 75.12 FT, THE LONG CHORD BEING S 64 DEG 34' 42" E 75.07 FT TO THE PT OF SD CURVE; TH S 61 DEG 53' 52" E, 5.55 FT TO THE PC OF A CURVE TO THE RIGHT WITH RADIUS OF 94.30 FT; TH ALG THE ARC OF SD CURVE ENTERING THE WLY ROW LINE OF JAMES P COLE BLVD, A DIST OF 104.95 FT, THE LONG CHORD BEING S 30 DEG 02' 03" E, 99.62 FT TO THE PT OF SD CURVE; TH S 02 DEG 02' 06" W 98.42 FT; TH S 71 DEG 22' 00" E, 1.45 FT; TH S 02 DEG 02' 06" W, 300.76 FT TO THE PC OF A CURVE TO THE RIGHT WITH RADIUS OF 1412.54 FT; TH ALG THE ARC OF SD CURVE A DIST OF 736.52 FT, THE LONG CHORD BEING S 16 DEG 58' 15" W, 728.21 FT TO THE PT OF SD CURVE; TH S 31 DEG 54' 21" W, 302.86 FT TO THE PC OF A CURVE TO THE LEFT, WITH RADIUS OF 1183.35 FT; TH ALG THE ARC OF SD CURVE A DIST OF 563.24 FT, THE LONG CHORD BEING S 18 DEG 16' 15" W, 557.94 FT; TH S 04 DEG 38' 00" W, 197.79 FT TO THE PC OF A CURVE TO THE RIGHT WITH RADIUS OF 15.21 FT; TH ALG THE ARC OF SD CURVE A DIST OF 29.05 FT, THE LONG CHORD BEING S 59 DEG 21' 47" W, 24.83 FT TO THE PT OF SD CURVE; TH N 20 DEG 13' 00" E, 10.01 FT; TH N 66 DEG 59' 02" W, 206.45 FT TO A PT ON A CURVE TO THE RIGHT WITH RADIUS OF 24.68

FT; TH ALG THE ARC OF SD CURVE A DIST OF 18.13 FT, THE LONG CHORD BEING N 03 DEG 10' 06" E, 17.73 FT TO THE PT OF SD CURVE; TH N 24 DEG 13' 00" E, 184.72 FT; TH N 17 DEG 35' 25" E, 447.25 FT; TH N 23 DEG 47' 39" E, 32.57 FT TO A BLDG CORNER; TH N 65 DEG 52' 07" W, ALG A BLDG WALL LINE EXT, 169.12 FT TO THE POB. CONT 15.79 ACRES. SPLIT

Parcel B – (Parcel ID: 41-06-452-015)
THAT PART OF VACATED ST JOHN ST AND OTHER VACATED STREETS, PT OF THE OLD RR ROW AND OTHER LANDS DESC AS: COM AT THE SW COR OF LOT 25 OF PLAT OF FLANDERS & HOURANS SUBDIVISION; TH N 24 DEG 13' 00" E, ALG THE ELY ROW LINE OF ST JOHN ST, 211.50 FT TO THE POB; TH N 65 DEG 47' 00" W, 2.35 FT; TH N 64 DEG 31' 55" W, 158.28 FT; TH S 40 DEG 14' 11" E, 1.25 FT; TH N 72 DEG 44' 20" W, 19.17 FT; TH N 17 DEG 08' 12" E, 154.66 FT; TH N 20 DEG 09' 39" E, 288.13 FT; TH N 19 DEG 17' 08" E, 35.22 FT; TH ALG A BLDG WALL LINE EXT S 65 DEG 52' 07" E, 169.12 FT TO A BLDG CORNER; TH S 23 DEG 47' 39" W, 32.57 FT TO A BLDG CORNER; TH S 17 DEG 35' 25" W, 447.25 FT TO THE POB. CONT 1.90 ACRES. SPLIT ON 12/06/2005 FROM 41-06-452-013; 2003 PARCEL DIVISION OF 11-06-452-011-9

Site photographs of the Subject Property and the surrounding area are presented in Appendix C of AKT's Phase I ESA (**Appendix A**).

2.2 Property Boundaries

The location of the Subject Property is shown on **Figure 1**, Subject Property Location Map and the general layout of the Subject Property is shown on **Figure 2**, Site and Surrounding Properties Map.

2.3 Site Map

A scaled site map, showing sample locations, depths is provided as **Figure 3**.

2.4 Subject Property Location

The Subject Property is comprised of two (2) parcels of land, comprising approximately 17.99-acres (Parcel A 16.09 acres and Parcel B 1.90 acres), and is located on the southwest corner of East Hamilton Avenue and James P. Cole Boulevard, north of East Wood Street in the City of Flint, Michigan, and has the following common address:

1809 James P. Cole Boulevard
Flint (Genesee County), Michigan 48503

2.5 Spatial Data

The Subject Property is located in Sections 6 and 7, Township 7 North, and Range 7 East of the Flint North Quadrangle Map, in Flint, Genesee County, Michigan. A geographic reference point for the Subject Property (Latitude [North]: 43.0324828 - 43° 1' 56.9382", Longitude [West]: 83.684671 - 83° 41' 4.815") was determined by Geosearch as part of the radial search activities and database review performed in support of AKT's Phase I ESA.

3.0 Facility Status

3.1 Known Contamination

Listings of the contaminants identified at the Subject Property by ECT in excess of the corresponding analytical reporting limits are provided together with the corresponding Chemical Abstract Service Numbers (CAS #) in **Table 3** below.

Table 3. Contaminants of Concern

Contaminants of Concern	CAS Number	Criteria Exceeded
Benzene (groundwater)	71432	DW, NRDW, GSI
Isopropylbenzene (groundwater)	98828	GSI
Naphthalene (groundwater)	91203	GSI
Trichloroethene (groundwater)	79016	DW, NRDW
Xylenes (groundwater)	1330207	GSI
Arsenic (groundwater and soil)	7440382	DW, NRDW, GSI, DC
Cadmium (groundwater)	7440439	DW, NRDW, GSI
Chromium (soil)	18540299	GSI
Copper (groundwater)	7440508	GSI
Lead (groundwater)	7439921	DW, NRDW, GSI
Selenium (soil)	7782492	GSI

DW: Drinking Water Protection, NRDW: Non-Residential Drinking Water, DC: Direct Contact, GSI: Groundwater Surface Water Interface

The listing of these contaminants is in addition to the contaminants previously documented in prior BEAs that were prepared by others for the Subject Property. See **Appendices D and E** for copies of these reports.

3.2 Laboratory Data

Copies of the analytical laboratory reports and chain-of-custody (COC) documentation for the samples collected by ECT on August 20, 2018 are included in **Appendix C.**

4.0 BEA Author

The primary author of this BEA was Ryan P. Higuchi, whose contact information is provided as follows:

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Ann Arbor, Michigan 48105
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BEA Review and Interpreter of this BEA was John D'Addona, P.E. who is a qualified Environmental Professional (EP) with over 30 years of experience in the environmental industry. His experiences include the management and review of hundreds of Phase I and II ESAs, BEAs, and Due Care Plans. His contact information is as follows:

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Principal Engineer
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Ann Arbor, Michigan 48105
jdaddona@ectinc.com
Tel. (734) 769-3004

5.0 ASTM Phase I ESA and AAI Documentation

A Phase I ESA, completed by AKT, is included as **Appendix A**. The Phase I ESA was completed in general accordance with ASTM Practice E 1527-13. The purpose of ASTM Practice E 1527-13 is to define good commercial and customary practice in the United States of America for conducting an environmental site assessment of commercial real estate properties with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA; 42 U.S.C. §9601) and petroleum products. The objective of Phase I ESAs is to provide all appropriate inquiries into the previous ownership and uses of the property consistent with good commercial and customary practice as defined at 42 U.S.C. §9601(35)(B) to permit a user to satisfy one of the requirements to qualify for the innocent landowner, contiguous property owner, or bona fide prospective purchaser limitations on CERCLA liability (a.k.a., landowner liability protections). The Phase II ESA investigation was completed in general accordance with ASTM Practice E1903-11, the Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process.

This BEA has been completed pursuant to Section 20126(1)(c) of Part 201 of the Natural Resources and Environmental Protection Act (NREPA) PA 451 of 1994, as amended (Part 201). In the preparation of this BEA, ECT considered hazardous substances as defined by Section 20101(1)(y) and/or regulated substances as defined by Section 21303(g). This BEA follows the suggested format for the "Contents of BEA Report," presented in EQP 4012 (02/2015).

6.0 References

Part 201 of the Natural Resources and Environmental Protection Act, Public Act 451 of 1994, as amended.

ASTM E 1527-13, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process.

ASTM Practice E1903-11, Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process.

Phase I Environmental Site Assessment, Parcels 41-06-452-014 and 41-06-452-015, City of Flint, Michigan prepared by AKT-Peerless, and dated July 11, 2018.

Baseline Environmental Assessment, Former DuPont Automotive Works Site 1555 James P. Cole Boulevard, Flint, Genesee County, Michigan prepared by AMEC Environment and Infrastructure, Inc. and dated January 4, 2013.

Baseline Environmental Assessment, 1555 James P. Cole Boulevard, Flint, Genesee County, Michigan prepared by Antea Group and dated December 7, 2016.

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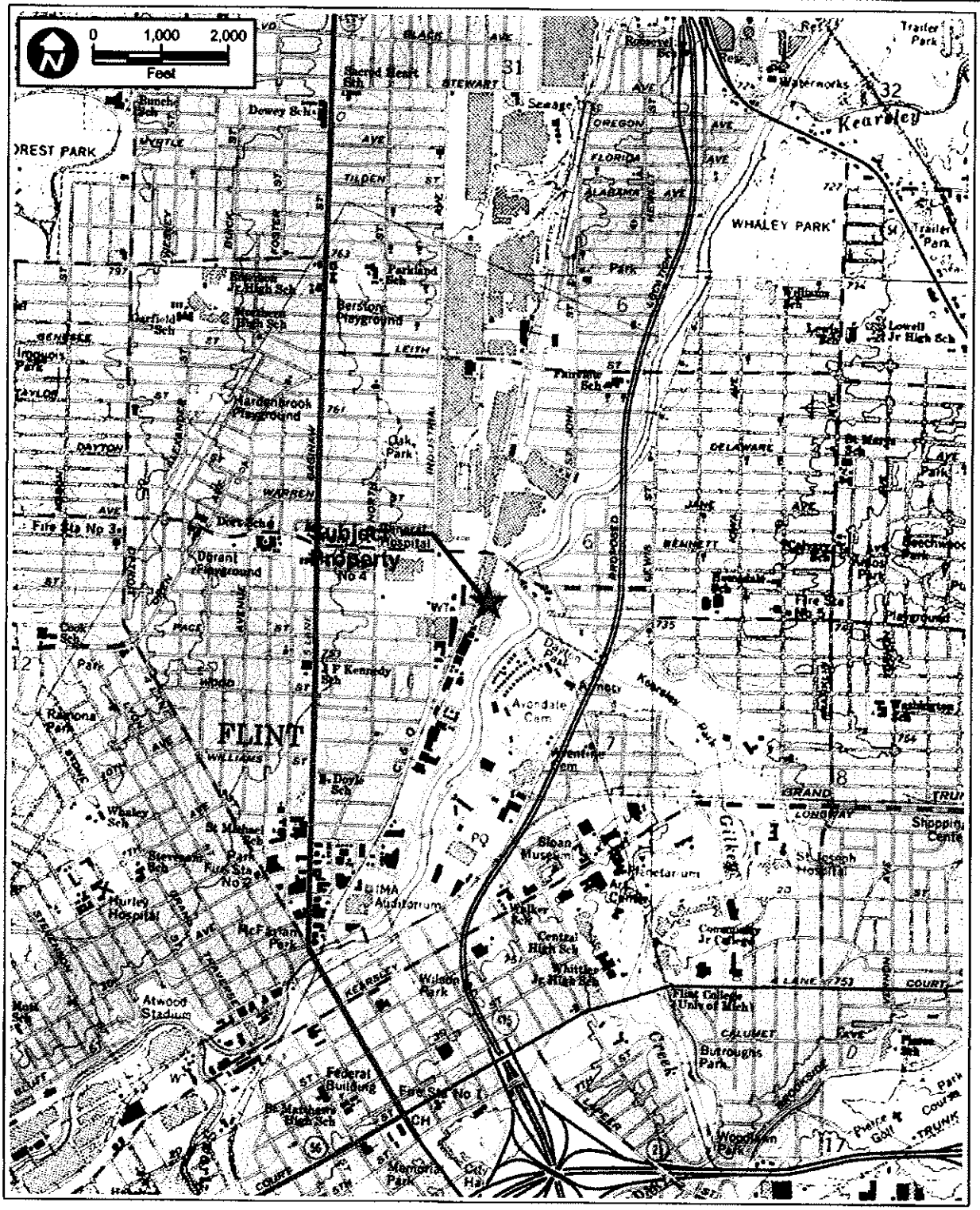

FIGURE 1.
SITE LOCATION MAP
PARCEL IDs: 41-06-452-014 & 41-06-452-015
FLINT, MI. 48503

Sources: ECT, 2018.

ECT Environmental Consulting & Technology, Inc.

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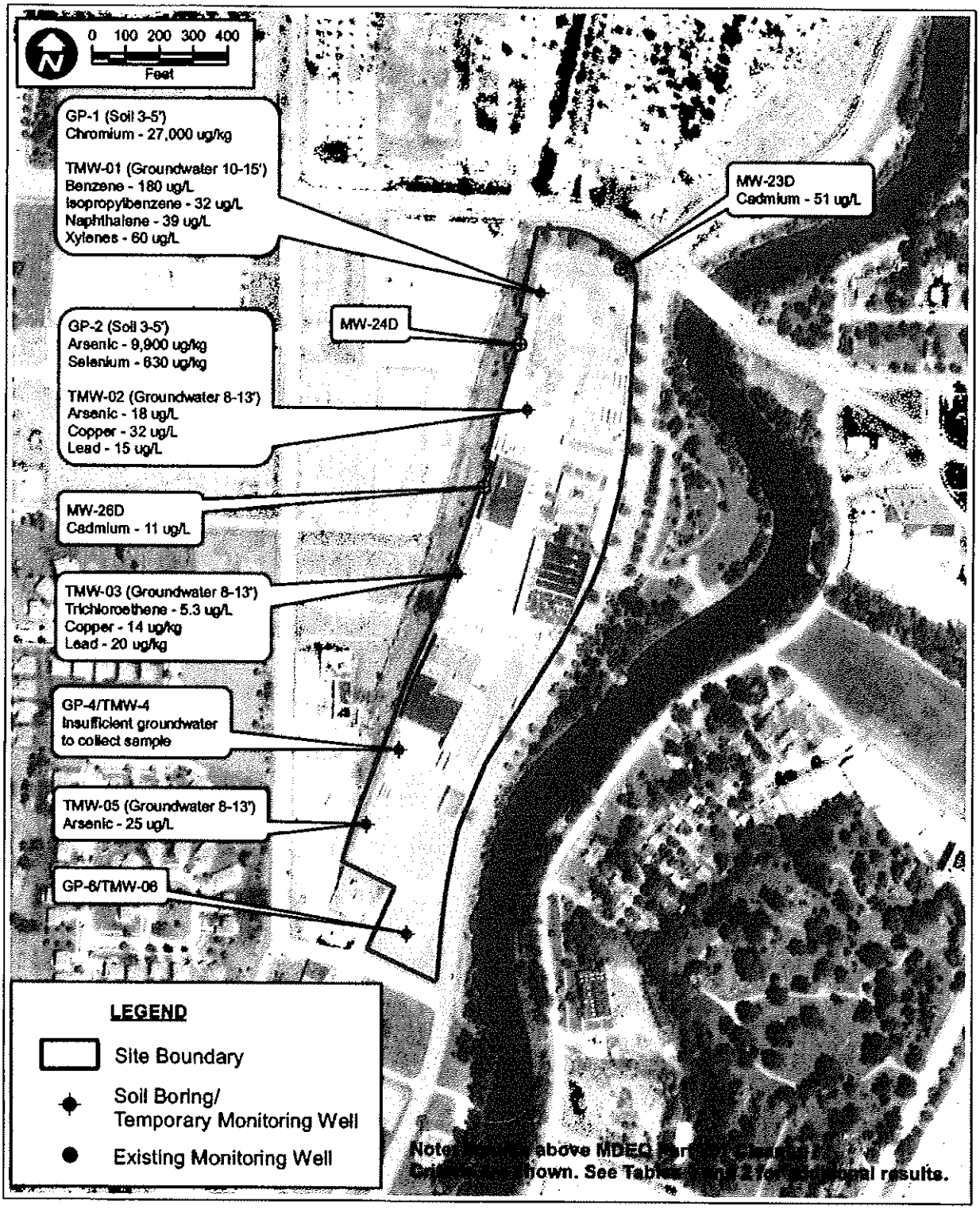

FIGURE 3.
SAMPLE LOCATION MAP
PARCEL IDs: 41-06-452-014 & 41-06-452-015
FLINT, MI. 48503

Sources: ECT, 2018

ECT Environmental Consulting & Technology, Inc.

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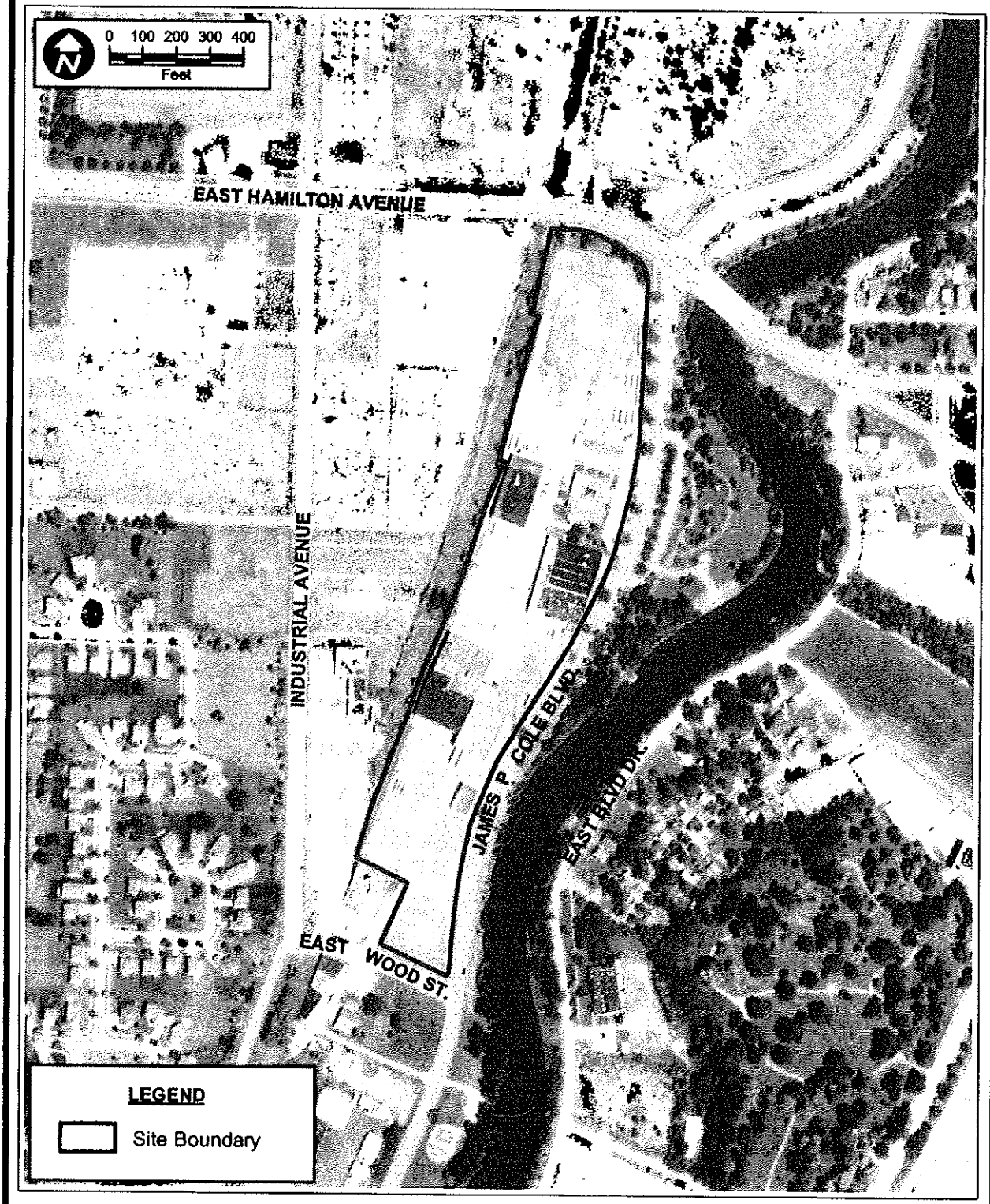

FIGURE 2.
SITE AND SURROUNDING PROPERTIES MAP
PARCEL IDs: 41-06-452-014 & 41-06-452-015
FLINT, MI. 48503

Sources: ECT, 2018.

ECT Environmental Consulting & Technology, Inc.

Table 1. Soil Analytical Summary

Former Dupont Facility

Matrix: Soil

Cleanup Criteria: Residential

	Chemical Abstract Service #	Part 201 Cleanup Criteria (December 2013)								Sample Location			
		Residential Criteria							Nonresidential				
		Statewide Default Background	Drinking Water Protection	Groundwater Surface Water Interface	Soil Volatilization to Indoor Air	Infinite Source Volatile Soil Inhalation	Direct Contact	Soil Saturation Concentration Screening Levels	Direct Contact	GP-1 (3-5') 8/20/18	GP-2 (3-5') 8/20/18	GP-5 (8-10') 8/20/18	GP-6 (3-5') 8/20/18
VOCs, ug/kg - Method 8260													
Benzene	71432	NA	100	240	1,600	13,000	180,000	400,000	400,000	nd	nd	nd	nd
n-Butylbenzene	104518	NA	1,600	ID	ID	ID	2,500,000	10,000,000	8,000,000	nd	nd	nd	nd
sec-Butylbenzene	135988	NA	1,600	ID	ID	ID	2,500,000	10,000,000	8,000,000	nd	nd	nd	nd
1,2-Dichloroethane	107062	NA	100	120	2,100	6,200	91,000	1,200,000	420,000	nd	nd	nd	nd
cis-1,2-Dichloroethene	156592	NA	1,400	12,000	22,000	180,000	640,000	640,000	640,000	nd	nd	nd	nd
trans-1,2-Dichloroethene	156605	NA	2,000	9,400	23,000	280,000	1,400,000	1,400,000	1,400,000	nd	nd	nd	nd
Ethylbenzene	100414	NA	1,500	360	87,000	720,000	140,000	140,000	140,000	nd	nd	nd	nd
Tetrachloroethene	127184	NA	100	220	11,000	170,000	88,000	88,000	88,000	nd	nd	nd	nd
Toluene	108883	NA	16,000	5,400	250,000	2,800,000	250,000	250,000	250,000	nd	nd	nd	nd
1,1,1-Trichloroethane	71556	NA	4,000	1,800	250,000	3,800,000	460,000	460,000	460,000	nd	nd	nd	nd
Trichloroethene	79016	NA	100	580	1,000	11,000	500,000	500,000	500,000	nd	nd	nd	nd
1,2,3-Trimethylbenzene	526738	NA	NA	NA	NA	NA	NA	NA	NA	nd	nd	nd	nd
1,2,4-Trimethylbenzene	95636	NA	2,100	570	110,000	21,000,000	110,000	110,000	110,000	nd	nd	nd	nd
1,3,5-Trimethylbenzene	108678	NA	1,800	1,100	94,000	16,000,000	94,000	94,000	94,000	nd	nd	nd	nd
Vinyl chloride	75014	NA	40	40	270	4,200	3,600	490,000	34,000	nd	nd	nd	nd
Xylenes	1330207	NA	5,600	820	150,000	46,000,000	150,000	150,000	150,000	nd	nd	nd	nd
other VOCs	Varies									nd	nd	nd	nd
PNAs, ug/kg - Method 8270													
Acenaphthene	83329	NA	300,000	8,700	190,000,000	81,000,000	41,000,000	NA	130,000,000	nd	nd	nd	nd
Acenaphthylene	208968	NA	5,900	ID	1,600,000	2,200,000	1,600,000	NA	5,200,000	nd	nd	nd	nd
Anthracene	120127	NA	41,000	ID	1,000,000,000	1,400,000,000	230,000,000	NA	730,000,000	nd	nd	nd	nd
Benzo(a)anthracene	56553	NA	NLL	NLL	NLV	NLV	20,000	NA	80,000	nd	nd	nd	nd
Benzo(a)pyrene	50328	NA	NLL	NLL	NLV	NLV	2,000	NA	8,000	nd	nd	nd	nd
Benzo(b)fluoranthene	205992	NA	NLL	NLL	ID	ID	20,000	NA	80,000	nd	nd	nd	nd
Benzo(g,h,i)perylene	191242	NA	NLL	NLL	NLV	NLV	2,500,000	NA	7,000,000	nd	nd	nd	nd
Benzo(k)fluoranthene	207089	NA	NLL	NLL	NLV	NLV	200,000	NA	800,000	nd	nd	nd	nd
Chrysene	218019	NA	NLL	NLL	ID	ID	2,000,000	NA	8,000,000	nd	nd	nd	nd
Dibenzo(a,h)anthracene	53703	NA	NLL	NLL	NLV	NLV	2,000	NA	8,000	nd	nd	nd	nd
Fluoranthene	206440	NA	730,000	5,500	1,000,000,000	740,000,000	46,000,000	NA	130,000,000	nd	nd	nd	nd
Fluorene	86737	NA	390,000	5,300	580,000,000	130,000,000	27,000,000	NA	87,000,000	nd	nd	nd	nd
Indeno(1,2,3-cd)pyrene	193395	NA	NLL	NLL	NLV	NLV	20,000	NA	80,000	nd	nd	nd	nd
2-Methylnaphthalene	91576	NA	57,000	4,200	2,700,000	1,500,000	8,100,000	NA	26,000,000	nd	nd	nd	nd
Phenanthrene	85018	NA	56,000	2,100	2,600,000	160,000	1,600,000	NA	5,200,000	nd	nd	nd	nd
Pyrene	129000	NA	480,000	ID	1,000,000,000	650,000,000	29,000,000	NA	84,000,000	nd	nd	nd	nd
Metals, ug/kg - Method 6020, 7471													
Arsenic	7440382	**5,800**	**4,600**	**4,600**	NLV	NLV	**7,600**	NA	37,000	3,200	**9,900**	1,900	1,400
Barium	7440393	75,000	1,300,000	440,000	NLV	NLV	37,000,000	NA	130,000,000	12,000	64,000	4,100	8,200
Cadmium	7440439	1,200	6,000	3,000	NLV	NLV	550,000	NA	2,100,000	nd	240	nd	nd
Chromium (Total)	Varies	**18,000**	30,000	**3,300**	NLV	NLV	2,500,000	NA	9,200,000	**27,000**	14,000	4,000	5,300
Copper	7440508	32,000	5,800,000	75,000	NLV	NLV	20,000,000	NA	73,000,000	4,000	16,000	3,500	3,100
Lead	7439921	21,000	700,000	2,500,000	NLV	NLV	400,000	NA	900,000	3,400	11,000	2,000	2,000
Mercury	Varies	130	1,700	**50**	48,000	52,000	160,000	NA	580,000	nd	82	nd	nd
Selenium	7782492	**410**	4,000	**400**	NLV	NLV	2,600,000	NA	9,600,000	nd	**630**	240	nd
Silver	7440224	1,000	4,500	100	NLV	NLV	2,500,000	NA	9,000,000	nd	nd	nd	nd
Zinc	7440666	47,000	2,400,000	170,000	NLV	NLV	170,000,000	NA	630,000,000	16,000	44,000	14,000	19,000

Note:
ID = insufficent data to develop criterion
na = not analyzed
nd = not detected
NLL = not likely to leach
NLV = not likely to volatilize

Assumptions:
hardness estimate for receiving waters = 150 mg/L
protective for surface water that is used as a drinking water source

Table 2. Groundwater Analytical Summary

Former Dupont Facility

Matrix: Groundwater

Cleanup Criteria: Residential

		Part 201 Cleanup Criteria (December 2013)					Sample Location							
		Residential Criteria												
	Chemical Abstract Service #	Drinking Water Protection	Nonres. Drinking Water	Groundwater Surface Water Interface	Indoor Air Inhalation	Groundwater Contact	TMW-1 (10-15') 8/20/18	TMW-2 (8-13') 8/20/18	TMW-3 (9-14') 8/20/18	TMW-5 (8-13') 8/20/18	TMW-6 (4-9') 8/20/18	MW-23D 8/20/18	MW-24D 8/20/18	MW-26D 8/20/18
VOC, ug/L - Method 8260														
Acetone	67-641	730	2,100	1,700	1,000,000,000	31,000,000	79	nd	nd	nd	nd	nd	nd	nd
Benzene	71432	**5.0**	**5.0**	**12**	5,600	11,000	**180**	nd	nd	1.2	nd	nd	nd	nd
n-Butylbenzene	104518	80	230	ID	ID	5,900	nd	nd	nd	nd	nd	nd	nd	nd
sec-Butylbenzene	135988	80	230	ID	ID	4,400	1.8	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	107062	5.0	5.0	6.0	9,600	19,000	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	156592	70	70	620	93,000	200,000	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,2-Dichloroethene	156605	100	100	470	85,000	220,000	nd	nd	nd	nd	nd	nd	nd	nd
Ethylbenzene	100414	74	74	18	110,000	170,000	5.6	nd	nd	nd	nd	nd	nd	nd
Isopropylbenzene	98828	800	2,300	**28**	56,000	56,000	**32**	nd	nd	nd	nd	nd	nd	nd
Naphthalene	91203	520	1,500	**11**	31,000	31,000	**39**	nd	nd	nd	nd	nd	nd	nd
n-Propylbenzene	103651	80	230	ID	ID	15,000	26	nd	nd	nd	nd	nd	nd	nd
Tetrachloroethene	127184	5.0	5.0	11	25,000	12,000	nd	nd	nd	nd	nd	nd	nd	nd
Toluene	108883	790	790	270	530,000	530,000	25	2.3	nd	1.3	nd	nd	nd	nd
1,1,1-Trichloroethane	71556	200	200	89	680,000	1,300,000	nd	nd	nd	nd	nd	nd	nd	nd
Trichloroethene	79016	**5.0**	**5.0**	29	2,200	22,000	nd	nd	5.3	nd	nd	nd	nd	nd
Trichlorofluoromethane	75694	2,600	7,300	NA	1,100,000	1,100,000	nd	nd	5.6	nd	nd	nd	nd	nd
1,2,3-Trimethylbenzene	526738	NA	NA	NA	NA	NA	9.1	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trimethylbenzene	95636	63	63	17	56,000	56,000	2.0	nd	nd	nd	nd	nd	nd	nd
1,3,5-Trimethylbenzene	108678	72	72	45	61,000	61,000	3.0	nd	nd	nd	nd	nd	nd	nd
Vinyl chloride	75014	2.0	2.0	1.0	1,100	1,000	nd	nd	nd	nd	nd	nd	nd	nd
Xylenes	1330207	280	280	**41**	190,000	190,000	**60**	nd	nd	nd	nd	nd	nd	nd
Other VOCs	Varies						nd	nd	nd	nd	nd	nd	nd	nd
PNA, ug/L - Method 8270														
Acenaphthene	83329	1,300	3,800	38	4,200	4,200	nd	nd	nd	nd	nd	nd	na	nd
Acenaphthylene	208968	52	150	ID	3,900	3,900	nd	nd	nd	nd	nd	nd	na	nd
Anthracene	120127	43	43	ID	43	43	nd	nd	nd	nd	nd	nd	na	nd
Benzo(a)anthracene	56553	2.1	8.5	ID	NLV	9.4	nd	nd	nd	nd	nd	nd	na	nd
Benzo(a)pyrene	50328	5.0	5.0	ID	NLV	1.0	nd	nd	nd	nd	nd	nd	na	nd
Benzo(b)fluoranthene	205992	1.5	1.5	ID	ID	1.5	nd	nd	nd	nd	nd	nd	na	nd
Benzo(g,h,i)perylene	191242	1.0	1.0	ID	NLV	1.0	nd	nd	nd	nd	nd	nd	na	nd
Benzo(k)fluoranthene	207089	1.0	1.0	NA	NLV	1.0	nd	nd	nd	nd	nd	nd	na	nd
Chrysene	218019	1.6	1.6	ID	ID	1.6	nd	nd	nd	nd	nd	nd	na	nd
Dibenzo(a,h)anthracene	53703	2.0	2.0	ID	NLV	2.0	nd	nd	nd	nd	nd	nd	na	nd
Fluoranthene	206440	210	210	1.6	210	210	nd	nd	nd	nd	nd	nd	na	nd
Fluorene	86737	880	2,000	12	2,000	2,000	nd	nd	nd	nd	nd	nd	na	nd
Indeno(1,2,3-cd)pyrene	193395	2.0	2.0	ID	NLV	2.0	nd	nd	nd	nd	nd	nd	na	nd
2-Methylnaphthalene	91576	260	750	19	25,000	25,000	nd	nd	nd	nd	nd	nd	na	nd
Naphthalene	91203	520	1,500	**11**	31,000	31,000	**39**	nd	nd	nd	nd	nd	na	nd
Phenanthrene	85018	52	150	2.0	1,000	1,000	nd	nd	nd	nd	nd	nd	na	nd
Pyrene	129000	140	140	ID	140	140	nd	nd	nd	nd	nd	nd	na	nd
Metals, ug/L - Method 6020, 7470														
Arsenic	7440382	**10**	**10**	**10**	NLV	4,300	nd	**18**	nd	**25**	nd	nd	nd	nd
Barium	7440393	2,000	2,000.0	670	NLV	14,000,000	nd	150	120	nd	140	nd	nd	nd
Cadmium	7440439	**5.0**	**5.0**	**2.5**	NLV	190,000	nd	nd	nd	nd		**51**	nd	**11**
Chromium (Total)	18540299	100	100	11	NLV	460,000	nd	nd	nd	nd	nd		nd	nd
Copper	7440508	1,000	1,000.0	**13**	NLV	7,400,000	nd	**32**	**14**	5.0	nd	6.2	6.2	6.4
Lead	7439921	**4.0**	**4.0**	**14**	NLV	ID	nd	**15**	**26**	3.0	nd	nd	nd	nd
Mercury	Varies	2.0	2.0	0.0013	56	56	nd	nd	nd	nd	nd	nd	nd	nd
Selenium	7782492	50	50	5.0	NLV	970,000	nd	nd	nd	nd	nd	nd	nd	nd
Silver	7440224	34	98	0.20	NLV	1,500,000	nd	nd	nd	nd	nd	nd	nd	nd
Zinc	7440666	2,400	5,000	170	NLV	110,000,000	nd	nd	64	nd	nd	88	nd	nd
PCBs, ug/L - Method 8020, 7471														
Polychlorinated biphenyls (PCB	1336363	0.50	0.50	0.20	45	3.3	nd	na	na	na	na	na	nd	na

Notes

ID = insufficient data to develop criterion

NA = not available

nd = not detected

NLV = not likely to volatilize

Assumptions:

hardness estimate for receiving waters = 150 mg/L

protective for surface water that is used as a drinking water source

RESOLUTION NO.: 210271

PRESENTED: JUN - 6 2021

ADOPTED: _____

RESOLUTION TO INCLUDE PUBLIC SERVANTS IN THE APPLICATION OF ALL CITY OF FLINT POLICIES, PROCEDURES AND REGULATIONS

BY THE CITY ADMINISTRATOR:

WHEREAS, The City of Flint enacts policies, procedures and regulations to protect the rights of public servants and the public; and

WHEREAS, public servants are "all persons employed or otherwise engaged by the corporation of the City of Flint to conduct business on its behalf including but not limited to elected officials, appointed employees, members of boards and commissions, classified employees, contractual employees, and volunteers." in Section 1-405 of the Flint Charter; and

WHEREAS, the City desires to make all policies, procedures and regulations applicable to public servants as defined under the City Charter; and

WHEREAS, the Human Resources Department is responsible for developing and maintaining policies and procedures for those acting on behalf of the City of Flint; and

WHEREAS, some City policies, procedures and regulations omit their applicability to public servants; and

WHEREAS, the Human Resources Department recommends that all City policies, procedures and regulations apply uniformly to public servants and that the term "public servant" shall be incorporated by reference in the enforcement of current and future City policies, procedures and regulations;

THEREFORE, BE IT RESOLVED that the Flint City Council approves and incorporates by reference that all City policies, procedures and regulations shall uniformly apply to public servants as defined in the City Charter and furthermore authorizes the Human Resources Director to enforce current and future City policies, procedures and regulations equally and uniformly to public servants.

FOR THE CITY OF FLINT:

Clyde D. Edwards, City Administrator

APPROVED BY CITY COUNCIL:

Kate Fields, City Council President

APPROVED AS TO FORM:

Angela Wheeler, Chief Legal Officer

CITY OF FLINT

RESOLUTION STAFF REVIEW FORM

TODAY'S DATE: *06/01/2021*

BID/PROPOSAL# NA

AGENDA ITEM TITLE: Resolution to incorporate by reference that all City of Flint policies, procedures and regulations shall apply to public servants uniformly and enforced by the Human Resources Department

PREPARED BY JoAnne Gurley
Legal Department

VENDOR NAME: NA

BACKGROUND/SUMMARY OF PROPOSED ACTION:

Resolution to incorporate by reference that approved City of Flint policies, procedures and regulations shall apply to public servants, who "are all persons employed or otherwise engaged by the corporation of the City of Flint to conduct business on its behalf including but not limited to elected officials, appointed employees, members of boards and commissions, classified employees, contractual employees, and volunteers;" as defined under Section 1-405 of Flint Charter.

While researching various City policies and procedures, the Human Resources Department discovered that many only apply to employees. However, other individuals act on the City's behalf such as members of boards and commissions, volunteers and elected officials.

By incorporating by reference that City policies, procedures and regulations are applicable to public servants, the Human Resources Department can enforce authorized rules and regulations uniformly among all who act on the City's behalf.

Therefore, it is the Human Resources Department's recommendation that the City of Flint incorporate by reference that all current and future City of Flint policies, procedures and regulations apply to public servants as defined in the Flint City Charter.

FINANCIAL IMPLICATIONS: NA

BUDGETED EXPENDITURE? YES ☐ **NO** x☐ **IF NO, PLEASE EXPLAIN:**

CITY OF FLINT

Dept.	Name of Account	Account Number	Grant Gode	Amount
		FY20/21 GRAND TOTAL		

PRE-ENCUMBERED? **YES** ☐ **NO** x☐ **REQUISITION NO:**

ACCOUNTING APPROVAL: _____ **Date:** _____

WILL YOUR DEPARTMENT NEED A CONTRACT? **YES** ☐ **NO** X ☐
(If yes, please indicate how many years for the contract) YEARS

WHEN APPLICABLE, IF MORE THAN ONE (1) YEAR, PLEASE ESTIMATE TOTAL AMOUNT FOR EACH BUDGET YEAR: (*This will depend on the term of the bid proposal)*

BUDGET YEAR 1 NA

BUDGET YEAR 2 NA

BUDGET YEAR 3 NA

OTHER IMPLICATIONS (*i.e., collective bargaining*): NA

STAFF RECOMMENDATION: *(PLEASE SELECT):* x☐ **APPROVED** ☐ **NOT APPROVED**

DEPARTMENT HEAD SIGNATURE: Angela Wheeler
(PLEASE TYPE NAME, TITLE)

RESOLUTION NO.: 210272

PRESENTED: JUN - 6 2021

ADOPTED: _____

BY THE CITY ADMINISTRATOR:

RESOLUTION TO ADOPT A PURCHASING POLICY FOR MULTI-YEAR CONTRACTS

WHEREAS, the Purchasing division frequently solicits quotes, bids, or proposals for multi-year contracts. Multi-year contracts allow for continuity of services and cost savings. Contracts over the $75,000 approval threshold require a Council Resolution, which details out the cost and price per year of the contract. Pending the adoption of the budget, each year of the contract is approved in the resolution.

IT IS RESOLVED, the Purchasing policy regarding multi-year contracts allows for the original resolution to serve as approval for each year of the contract, assuming no changes in price or terms.

APPROVED AS TO FORM:

Angela Wheeler (Jun 1, 2021 12:23 EDT)

Angela Wheeler, Chief Legal Officer

APPROVED AS TO FINANCE:

Shelbi Frayer (Jun 1, 2021 13:22 EDT)

Shelbi Frayer, Chief Financial Officer

FOR THE CITY OF FLINT:

CLYDE D EDWARDS (Jun 2, 2021 12:50 EDT)

Clyde Edwards, City Administrator

APPROVED BY CITY COUNCIL:

Kate Fields, City Council President

APPROVED AS TO PURCHASING:

Jennifer Ryan (Jun 1, 2021 11:49 EDT)

Jenn Ryan, Deputy Finance Director

RESOLUTION: 210331

PRESENTED: JUL 2 1 2021

ADOPTED: _____

RESOLUTION SWITCHING TO EVEN NUMBERED YEAR ELECTIONS AS AUTHORIZED BY MCL 168.642 AND 168.642a AND AS REQUIRED BY FLINT CITY CHARTER §9-102(F)

BY THE MAYOR:

WHEREAS, The newly revised Flint City Charter was adopted on August 7, 2017 and became effective on January 1, 2018.

WHEREAS, Flint City Charter Sec. 9-102(F) states, "The City Council shall adopt, in 2021, a resolution required to switch to even numbered year elections as authorized by MCL 168.642 and 168.642a.

WHEREAS, MCL 168.642a(4) states:

> After December 31, 2011, a city that holds its regular election for city offices annually or in the odd year on the November regular election date may change its regular election schedule to the even year general election and the even year primary election by adopting a resolution in compliance with section 642. If a city council adopts the resolution in compliance with section 642, after December 31 of the year in which the resolution is adopted, the city's regular election is at the even year general election and its primary is at the even year primary election.

WHEREAS, Before adopting the resolution, and in accordance with MCL 168.642(7)(ii)(b), the City Council is required to hold at least 1 public hearing on the resolution and the public hearing may be held on the same day and immediately before considering the adoption of the resolution. Therefore, a public hearing was held on July 26, 2021.

THEREFORE BE IT RESOLVED that the City Council hereby adopts this resolution switching to even numbered year elections;

BE IT FURTHER RESOLVED that the City Clerk will file this resolution with the secretary of state forthwith.

BE IT FURTHER RESOLVED that after December 31, 2021, the City's regular election will take place at the even year general election and its primary at the even year primary election.

APPROVED AS TO FORM:

Angela Wheeler
Chief Legal Officer

FOR CITY OF FLINT:

Sheldon A. Neeley, Mayor

CITY COUNCIL:

Kate Fields, Council President

RESOLUTION NO.: 210157

PRESENTED: APR - 7 2021

ADOPTED: _____

RESOLUTION FOR THE APPOINTMENT OF DR. NANCY LOVE TO THE WATER SYSTEM ADVISORY COUNCIL

BY THE MAYOR:

WHEREAS, pursuant to the State of Michigan's administrative rules section 325.10410(7), water supplies serving a population of 50,000 or more, and consecutive systems serving a population of 50,000 or more, shall create a water system advisory council;

WHEREAS, the council shall consist of at least five members, appointed by the community supply;

WHEREAS, the purpose of this council is to improve transparency in the City of Flint community by developing materials and advising the water system on public awareness and education efforts.

WHEREAS, to be eligible for appointment to the council, an individual shall have a demonstrated interest in or knowledge about lead in drinking water and its effects.;

WHEREAS, the council will develop plans for continuing public awareness about lead in drinking water, even when the action level is not exceeded,; review public awareness campaign materials provided by the statewide drinking water advisory council to ensure the needs and interest of the community, considering the economic and cultural diversity of its residents, are addressed; advise and consult with the water supply on the development of appropriate plans for remediation and public education to be implemented if a lead action level is exceeded; advise and consult with the water supply on efforts to replace private lead service lines at locations where the owner declined service line replacement; assist in promoting transparency of all data and documents related to lead in drinking water within the water supply service area

WHEREAS, Mayor Neeley desires to appoint Dr. Nancy Love to the Water System Advisory Council (See Attached Resume).

NOW THEREFORE BE IT RESOLVED, that Mayor Neeley hereby appoints Dr. Nancy Love address 1351 Beal Avenue, Ann Arbor, MI 48109 to serve on the Water System Advisory Council.

APPROVED AS TO FORM:

Angela Wheeler

Angela Wheeler, City Attorney

FOR THE CITY OF FLINT:

Sheldon A. Neeley, Mayor

APPROVED BY CITY COUNCIL:

_____

Kate Fields, City Council President

S:\AWO\Water System Advisory Council\Revised Documents\J.Gaskin (Clean Copy0 Resolution to Appoint to the Water System Advisory Council (1).doc

NANCY G. LOVE, Ph.D., P.E., BCEE

Borchardt and Glysson Collegiate Professor
3BUniversity of Michigan, 4B183 EWRE, 1351 Beal Avenue, Ann Arbor, MI 48109-2125
0BVoice: (734) 763-9664; 2BE-mail: nglove@umich.edu; N-E-Wcycles.org *(under construction)*

RESEARCH OVERVIEW

In collaboration with my students, I work at the interface of water, infrastructure, and public health in both domestic and global settings. My group advances public and environmental health using chemical, biological, and computational approaches applied to water systems, and co-design methods in partnership with communities. Specific project areas include: evaluating the fate of chemicals, pathogens and contaminants of emerging concern in water with relevance to public health and the environment; using technologies to sense and remove these constituents; advancing technologies that recover useful resources from water, and developing approaches that enable local decision-making around water quality, resource efficiency, and equity.

EDUCATION

Doctor of Philosophy — 1994
Environmental Systems Engineering, Clemson University
Advisor: C. P. Leslie Grady Jr.

Masters of Science — 1986
Civil Engineering, University of Illinois at Urbana-Champaign
Advisor: John T. Pfeffer

Bachelors of Science — 1984
Civil Engineering, University of Illinois at Urbana-Champaign

PROFESSIONAL EXPERIENCE AND LICENSURE

Professor — 2008-present
Department of Civil & Environmental Engineering, University of Michigan (U-M)
Co-Founder and Co-PI, Environmental Biotechnology Lab, U-M

U-M Faculty Affiliate — Present
Graham Sustainability Institute (http://graham.umich.edu/); Energy Institute (https://energy.umich.edu/); Poverty Solutions Institute (https://poverty.umich.edu/); African Studies Center (https://ii.umich.edu/asc)

Licensed Professional Engineer — 2010 - present
Environmental Engineering, State of Michigan, License No. 6201057483.

Adjunct Professor — 2016 - 2019
Institute of Biotechnology, Addis Ababa University, Ethiopia

Staff — Feb – July 2014
UNESCO-IHE (United Nations Water Education Institute), sabbatical

Associate Dean for Academic Programs and Initiatives — 2011 - 2012
Horace H. Rackham School for Graduate Studies

Board Certified Environmental Engineer (BCEE) — 2011-present
Certified by Eminence, American Academy of Environmental Engineers

Department Chair — 2008 – 2011
Department of Civil and Environmental Engineering, University of Michigan

Professor — 2005 – 2007
Department of Civil and Environmental Engineering, Virginia Tech

Adjunct Professor — 2002 – 2007
Department of Biological Sciences, Virginia Tech

Associate Professor Department of Civil and Environmental Engineering, Virginia Tech	2000 – 2005
Assistant Professor Department of Civil and Environmental Engineering, Virginia Tech	1994 – 2000
Co-Founder and Co-Principal Investigator at Virginia Tech	
Environmental BioNanoTechnology Laboratory, Virginia Tech	2005 – 2007
Fralin Environmental Biotechnology Laboratory, Virginia Tech	1995 – 1999
Project Engineer CH2M Hill, Inc. (now Jacobs Engineering Group), Dallas, Texas	1986 – 1989

ADMINISTRATIVE ACCOMPLISHMENTS

• Became Diversity, Equity, and Inclusion (DEI) chair in the summer of 2020 to re-envision leadership around DEI and lead a collaborative team to develop an actionable roadmap for change. The committee was transformed to include voting members from across the department (students, staff, post-docs and faculty), all member categories were given equally visible leading positions in the committee, and structured the committee operating practices toward transparency and inclusion to serve as a model. A roadmap to drive systemic change was drafted, vetted, modified and is being finalized for publication. The roadmap includes efforts and goals across six pillars (recruiting a diverse community; building and valuing DEI skills; fostering a strong, connected, and successful community; developing a healthy and safe environment for mentoring, sponsorship, and advocacy; enabling an honest and transparent dialogue; and transforming our curriculum). In anticipation of an upcoming sabbatical and to ensure leadership continuity, I stepped down as lead once the roadmap was entering final production. This allows a new leader to be established in time for the public launch.	July 2020 - current
• As a member of the board of the Association of Environmental Engineering and Science Professors (a position elected by the organization's membership), I was elected onto the Vice-President, President-Elect, and President path by the board. As president, I engaged international members by hosting the first AEESP-International Water Association (IWA) joint reception at the IWA World Congress in Quebec City, and appointed international members to key committee leadership positions. I also initiated the movement of the organization from being self-run to using a management company that continues to oversee the board's functions. This has allowed the board to act more as a visionary and less as a managing body. All these changes remain today.	2007-2011
• As department chair of Civil and Environmental Engineering at the University of Michigan, I lead or oversaw: a significant transition in administrative staff; centralization of departmental operating management to enhance efficiencies; the development of procedures to achieve a balanced budget; the development of standard operating procedures and a governing document for the first time; the development of new strategic directions for the department; an increase in external funding of 40%; the doubling of student enrollments within a 5 year period; addition of $8.5 million to the department's endowment; and hiring five faculty.	Jan 2008– Aug 2011
• As a co-PI of the $3.5 million Virginia Tech NSF Advance Institutional Transformation Grant focused on women's leadership in academia, I lead activities associated with graduate student and post-doctoral engagement toward the professoriate.	July 2003– June 2008

MAJOR HONORS AND NOTABLE RECOGNITIONS

• American Society of Civil Engineers Wesley W. Horner Award for Daigger et al., Progress and Promise Transitioning to the One Water/Resource Recovery Integrated Urban Water Management Systems. *J Env Eng*, 2019.	2021
• American Academy of Environmental Engineers & Scientists Science Award	2020
• University of Illinois Urbana-Champaign Civil & Environmental Engineering Alumni Assoc. Distinguished Alumna Award	2020
• Kappe Lecture, American Academy of Environmental Engineers & Scientists	2019 - 2020
• AEESP/WEF Master Lecture: An Academic Perspective on Rethinking Urban Water Infrastructure Across the Classroom, Lab and Field. WEFTEC 2017, Chicago IL. October 2, 2017.	2017
• Distinguished Faculty Fellow in Sustainability, University of Michigan	2017-present
• Named Borchardt and Glysson Collegiate Professor, University of Michigan	2016
• Elected Fellow, Association of Environmental Engineering & Science Professors.	2015
• *Environmental Science and Technology Letters*, Best of the Best Paper Award for Delgado Vela et al. 2015 (see publications list).	2015
• Selected AEESP Distinguished Lecturer.	2015-2016
• Elected Fellow of the International Water Association.	2014
• Alec Gallimore Faculty Award from the Society of Minority Engineers and Scientists - Graduate (SMES-G) for being an effective advocate, ally and advisor to students of color, April 2012.	2012
• Gordon Maskew Fair Distinguished Engineering Educator, Water Environment Federation.	2011
• Elected Fellow of the Water Environment Federation. Inaugural class.	2011
• Certification by Eminence, Board Certified Environmental Engineer (BCEE). American Academy of Environmental Engineers.	2011
• President and Member of the Board, Association of Environmental Engineering and Science Professors. Position on Board of Directors is elected nationally, and position of president is then elected by the Board of Directors.	2007 - 2011
• Rudolfs Industrial Waste Management Medal for noteworthy accomplishments in industrial waste management research, Water Environment Federation. For Henriques et al. 2007. Activated sludge inhibition by chemical stressors – a comprehensive study. *Water Environment Research* **79**(9):940-951.	2008
• CEE Alumni Teaching Excellence Award, Virginia Tech	2006
• Women's Center Advancing Women Award, Virginia Tech	2005
• Excellence in Research Award, College of Engineering, Virginia Tech	2005
• Faculty Fellow, $15,000 over 3 years, College of Engineering, Virginia Tech	2003 – 2006
• Harrison Prescott Eddy Medal for outstanding contribution to wastewater principles/process research, Water Environment Federation. For Charles B. Bott and Nancy G. Love, for "Investigating a mechanistic cause for activated sludge deflocculation in response to shock loads of toxic electrophilic chemicals." *Water Environment Research*, **74**:306-315 (2002).	2003
• Outstanding Young Alumni, College of Engineering & Science, Clemson Univ.	2002
• Paul L. Busch Award for Innovation in Applied Water Quality Research, Water Environment Research Foundation ($100,000)	2001

- National Science Foundation CAREER Award Recipient — 1995
- American Association of University Women Selected Professions Fellow — 1993
- Chi Epsilon Civil Engineering Honor Society initiate — 1985

PROFESSIONAL MEMBERSHIPS, ACTIVITIES AND APPOINTMENTS

Editorial Boards

- **ACS ES&T Engineering**, Associate Editor (inaugural) — 2020 - present
- **Water Environment Research**
  - Editorial Board — 2019 – present
  - Editor-in-Chief search committee — 2009
  - Associate Editor — 2002 - 2005
- **Environmental Engineering Science**, Editorial Board — 2015 - present

Current Memberships and Activities

- **American Association for the Advancement of Science**
  - Member — 2016 - present
- **American Academy of Environmental Engineers and Scientist (AAEES)**
  - Member — 2011 – present
  - Board Certified Environmental Engineer (by eminence) — 2012 – present
  - Environmental Engineering Science Awards Committee — 2020 - present
  - Environmental Engineering and Science Foundation Board of Directors — 2014-2016
- **American Chemical Society**
  - Member — 2012 - present
- **American Society of Civil Engineers (ASCE)**
  - Member — Discontinuous
  - Active participant: ASCE Department Chair's meetings — 1980's – present
  - EWRE Sustainability subcommittee — 2008-2011
- **American Society for Engineering Education**
  - Member — 2007 - 2009
- **Association of Environmental Engineering and Science Professors**
  - Member and Fellow (2015) — Discontinuous 1994 - present
  - Master's Thesis Awards Subcommittee (Chair, 1999) — 1994 – present
  - Awards Committee (Chair, 2006-2007) — 1997 – 1999
  - Board of Directors (Elected by membership; elected by board as Vice-President 2008-2009; President-Elect 2009-2010; President 2010-2011) — 2004 – 2007
  - Co-Chair, AEESP 2017 Biannual Conference — 2007 – 2011
  - AEESP Fellows Selection Committee — 2016-2017
- **International Water Association** — 2018
  - Member and Fellow (2014) — 1989 – present
  - Environmental Engineering Education specialist's group, chair effective 2014 — 2006 - present
  - Microbial Ecology in Water Engineering (MEWE, formerly Activated Sludge Population Dynamics) Specialty Group member — 1995 – present
  - MEWE program committee — 2005 - 2019
  - Chair, MEWE2013 conference, Ann Arbor, Michigan USA — 2012 - 2013
  - Leading Edge Technology (LET) Program Committee — 2007 – 2009
  - Instrumentation, Control and Automation Group — 2001 – 2007
  - Organizing Committee, Nutrient Management 2007 Workshop — 2005 – 2007

MEGA working group member	2005 – 2008
Biofilms 2010 Conference Program Committee	2009 – 2010
• **Water Environment Federation**	
Member and Fellow (2011)	1986 – present
Awards Committee	2012 - present
Research Symposium Subcommittee	1999 – 2003
Virginia WEA Student Activities Committee	1997 – 2007
Work Force Task Force – WEF Presidential Appointment	2008 – 2009
Nutrient Specialty Conference Program Committee	2008 - 2009
Chair, Academic Committee	2009 – 2013
• **Water Environment Research Foundation**	
Leaders Innovation Forum for Technology (LIFT) Steering Committee	2015 – current
Chlorination Control and Monitoring Practices Project Advisory Committee	2000 - 2002
Wastewater Security Project Subcommittee	2003 – 2004
Sensors for Security in WWT Systems Project Advisory Committee	2005 – 2007
Paul L. Busch Award Selection Committee	2005 – 2011
Membrane Aerated Biofilm Reactor Project Advisory Committee, U2R14	2016-2018

Current Board Appointments

• **National Water Research Institute** Independent Science Advisory Panel for Metropolitan Water District	2019-present
• **ReNUWit Engineering Research Center** Science Advisory Board, Stanford, UC-Berkeley, Colorado School of Mines, New Mexico State University	2015-2020
• **University of Iowa NSF Sustainable Water Development Graduate Program** Advisory Board Member	2017-2019

Prior Memberships, Activities and Board Appointments

• **American Society for Microbiology**, Member	1991–2010
• **Environmental Protection Agency** EPA Science Advisory Board, Drinking Water Subcommittee	2010 - 2012
• Appointed Member, **Michigan Department of Agriculture/Michigan Department of Environmental Quality Food Processors Working Group**	2009 - 2010
• **Michigan Economic Development Corporation (MEDC) Water Cluster Committee**, establishing water-based technology investment goals for Michigan.	2008 – 2010
• **National Society of Professional Engineers** Member	Discontinuous 1987 - 2019
• *Member,* **NSF's CLEANER (later, WATERS Network) Initiative** as (a) planning phase participant, (b) Co-PI on environmental impacts to coastal margins planning grant and (c) Member, sensor sub-committee.	2002 – 2007
• Appointed by Governors Warner and Kaine (Virginia) to the **Scientific and Technical Advisory Committee to the Chesapeake Executive Council** Workshop co-chair and author, Establishing a Research Agenda for Assessing the Bioavailability of Wastewater-Derived Organic Nitrogen in Treatment Systems and Receiving Waters, September 27 and 28, 2007, Baltimore, Maryland. Hhttp://www.chesapeake.org/stac/Pubs/eonreport.pdfH	2005 – 2007
• **Women in Engineering Leadership Institute (WELI) Strategic Planning Committee**	2004 – 2005

MAJOR COMMUNITY SERVICE AND OUTREACH ACTIVITIES

- **N95DECON.org.** A consortium of volunteer researchers from universities across the United States and world who worked to decipher, evaluate, and disseminate technically accurate information about N95 respirators as well as other kinds of masks and face coverings, in response the coronavirus pandemic. A key member of the Heat Treatment sub-team and participant in other subcommittees, as needed. — April 2020 - present
- **City of Flint Technical Advisory Committee.** Appointed by Mayors Weaver (2017-2019) and Neeley (2019 – current) to provide guidance on behalf of the city's efforts in response to the Flint Water Crisis and other environmental and public health needs. — 2017 – present
- **Train-the-Trainers.** Designed, developed, and delivered a curriculum about faucet-mounted point-of-use filters to Flint residents who became trainers for other Flint residents. Syndicated the curriculum to other communities with input from Flint community and partners. — 2018 - present
- **K-12 Drinking Water Filtration.** Working with multiple organizations in the following ways: (a) developing and providing technical guidance on assessing the performance of point-of-use filters and advanced hydration stations used in schools (Flint Community Schools, Ann Arbor Public Schools); (b) provided technical input to the development of a model law by the National Resources Defense Council; (c) serving in a technical advisory role to the FilterFirst grassroots initiative that has successfully introduced bipartisan legislation in the State of Michigan to require point-of-use filtration of drinking water in schools and daycare centers throughout the state. — 2018 - present
- **Partnerships around Research and Education in Ethiopia.** Partnering with faculty in various Institutes at Addis Ababa University in Ethiopia to advance graduate education as new Ph.D. programs are implemented. Create opportunities for AAU students to visit U-M for beneficial research experiences and partner those students with U-M Ph.D. students who serve as peer collaborators. Serve on the Ph.D. committees of AAU students. — 2017 - 2019
- **Community-Targeted Scholarship**
  N. G. Love, R. Jackson, S. P. McElmurry. Water Stays in the Pipes Longer in Shrinking Cities – A Challenge for Public Health. *The Conversation*, May 24, 2019. http://theconversation.com/water-stays-in-the-pipes-longer-in-shrinking-cities-a-challenge-for-public-health-116119

  N. G. Love. We All Deserve to Have Confidence in Our Water. *Medium*. May 10, 2019. https://medium.com/@nglove/we-all-deserve-to-have-confidence-in-our-water-6994b2f7e00c?source=friends_link&sk=a1703f45b607977176581383l9b971b1

MAJOR UNIVERSITY, COLLEGE & DEPARTMENT SERVICE/PROGRAMMATIC RESPONSIBILITIES

University of Michigan

- President's Public Health Advisory Committee on COVID — Fall 2020-present
- UM Center for Global Health Equity Leadership Council, and co-chair of Climate Vulnerability and Health group. $20 million center that is launching in 2021. — Aug 2020-present
- University of Michigan Scientific Reviewer, Institutional Biosafety Committee (IBC), appointed by Vice President for Research — July 1, 2020 – June 30, 2023
- CEE Diversity, Equity, and Inclusion Chair (through 2020), then committee member — Aug 2020–present
- CEE Executive Committee (elected position) — 2019-2021
- Undergraduate Recruitment Committee — 2019-2020
- Richart Lecture Committee — 2017-2018

	2019-2020
• Advisory Group on University of Michigan activities in Ethiopia, Provost's office	2017-2019
• Advisory Group: U-M Lead and Copper Rule Project, Graham Institute overseeing Mott Foundation project.	2018-2019
• Civil and Environmental Engineering Strategic Plan Implementation and Development Committee, Revising plan in 2017-2018	2013-2018
• College of Engineering Graduate Recruitment, Retention & Summer Programs Advisory Group	2017-2018
• Internal Advisory Board Member, Center for Socially-Engaged Design	2017-2020
• Administrative Structure Working Group, School of the Environment and Sustainability Transition Subcommittee	2017
• U-M ADVANCE LAUNCH Committee Chair	2016-2017
• College of Engineering Promotion, Tenure and Reappointment Process Review Committee, Chair	2017
• UM Energy Institute Faculty Affiliate (https://energy.umich.edu/)	2018-present
• College of Engineering Faculty Search Committee for positions in Engineering Education Research (EER)	2015-2016
• Ethiopia – Michigan Collaborative Consortium (EMC2) Planning Committee, appointed by Assoc Provost James Holloway	2015-2018
• Provost's Committee on Environment and Sustainability	2016
• Provost's Poverty Visioning Committee	2015-2016
• Integrated Training in Microbial Systems (ITiMS) (Burroughs Wellcome Fund training program) Faculty Affiliate	2015 - present
• President's Advisory Commission on Women's Issues	2014-2015
• President's Postdoctoral Fellowship Advisory Committee	2014-2015
• Rackham Graduate School Dean Search Committee	2014
• Provost's Promotion and Tenure Committee	2013
• Mentoring Others Results in Excellence (MORE) Committee, Rackham Graduate School, Member and Chair	2012 - 2013
• Alumni Liaison Committee, Civil and Environmental Engineering	2012-2014
• Deans Advisory Committee on Female Faculty, College of Engineering	2012-2013
• Faculty Search Committee Co-Chair, Civil and Environmental Engineering	2011-2012
• Center for Molecular and Clinical Epidemiology of Infectious Diseases (MAC-EPID) Faculty Affiliate	2009 - present
• Graham Sustainability Institute Faculty Affiliate	2009 - current
• College of Engineering Alumni Awards Selection Committee	2011
• Graham Environmental Sustainability Institute, Executive Committee	2009 - 2011
• College of Engineering Dean's Advisory Committee on Faculty Diversity	2010 - 2012
• Provost's Office - Classroom Emergency Training Video Planning Group	Fall 2008 – 2009
• College of Engineering *ad hoc* Committee on Graduate Student Excellence	Summer 2008
Virginia Tech	
• Chair, College of Engineering "Think Tank" Committee (6 faculty)	2006 – 2007
• Space/Overhead Return Allocation *ad hoc* Committee, Provost apptmt	2005

- College of Engineering Dean's Search Committee — 2005
- co-Coordinator, Via Academic Preparation Program for graduate student professional development, Dept of Civil and Environmental Engineering — 2004 – 2007
- co-Principal Investigator and Advance Professor for $3.5 million NSF Advance Institutional Transformation grant focused on increasing the participation and advancement of women in academic STEM careers. Chair: Advancing Women into the Profession — 2003 – 2006
- Environmental Public Health Committee — 2003 – 2004
- Provost's Implementation Committee, Biomedical & Public Health Institute — 2002
- Board of Directors, WPI, Inc., a Virginia Tech affiliated company. — 2001 – 2003
- Provost's Environmental Health Committee — 2002
- Provost's Committee on Biomedical Research — 2001 – 2002
- College of Engineering Diversity Committee — 2001 – 2005
- Environmental Engineering Laboratory Coordinator & staff supervisor — 1997 – 2005
- University Cross Cutting Initiatives Committee, Environment & Energy — 1998 – 2000
- Fralin Biotechnology Center 5 Year Review Committee — 2000
- Environmental Engineering Graduate Student Recruitment Officer — 2000

UNIVERSITY TEACHING RESPONSIBILITIES

Introduction to Environmental Engineering; Models in Environmental Engineering; Water and Wastewater Treatment Design; Applied Biology of Environmental Systems; Biological Treatment Processes: Theory and Design; Environmental Microbiology; Introduction to Civil and Environmental Engineering; Engineering Solutions to Global Water Issues (Freshmen Design–Build–Test course); Decentralized Water Supply, Hygiene and Sanitation (co-produced with faculty at Addis Ababa University, Ethiopia); Urban Environmental Systems: Project-based Experiences for Students (focused on a diverse group of students in Engineering; Urban Planning, Public Health, Environment & Sustainability); Robots, Sensors and Smart Water Systems (co-developed Freshmen Design–Build–Test Course)

ADVISING RESPONSIBILITIES

Currently serving as advisor for 2 undergraduate research students, 1 master's students, and 8 Ph.D. students. Previously advised 44 M.S. students with thesis or significant project, 18 Ph.D. students, 7 post-doctoral research associates, and 36 undergraduate research projects/theses.

Major Undergraduate Research Projects

1. Harrison Suchyta. Summer 2019-current. Developing urine-derived fertilizers for flowering and woody plants at UM's Botanical Garden.
2. Leah Pifer. Fall 2019 – current. Developing an algorithm for a hand-held water quality monitoring strip.
3. Julia Raneses. Fall 2019 – Aug 2020. Building-Scale Urine Separation Systems.
4. Kensey Dahlquist. Spring 2019 – current. Projects in support of building-scale urine separation, collection and processing for nutrient-energy-water cycling.
5. Yen Jee Ooi. Summer 2018 (at Rich Earth Institute), then Fall 2018-2019. Nutrient analysis for NSF INFEWS project.
6. Brittany Brown. Summers 2017 and 2018. Characterization of *Stenotrophomonas maltophilia* from drinking water through culturing and qPCR, and bioavailability of high versus low water age carbon.
7. Myriam Sarment. 2018 summer. Bioavailability of high versus low water age carbon in drinking water isolates.
8. Alexi Sinanaj. 2017 – 2018. Pharmaceutical removal from urine through activated carbon adsorption.
9. Brady Nishimiya. 2017-2018. Disinfection residual effectiveness of point-of-use product.
10. Nicholas Lowe. 2017-2018. Automated flushing device to improve water quality through point-of-use drinking water filters.

11. Dylan Raye-Leonard. 2016-2018. Urine-derived fertilizer project.
12. Brittany Brown. 2016. Microbial ecology of novel nitrogen removal systems.
13. Ishi Keenum. 2015 – 2016. Plasma treatment of source-separated urine for fertilizer development (co-mentor with K. Wigginton).
14. Mariah Gnegy. 2015-2016. DNA-based analysis of bacteria and viruses in source separated urine (co-mentor with K. Wigginton).
15. Weitian Wang. 2010-2011. Microaerobic Removal of Pharmaceuticals from Wastewater
16. Celine Saucier. 2010-2011. Nitrate Removal to Enable the Effluent Organic Nitrogen Bioassay
17. Bryan VanDuinen. 2009. Life Cycle Assessment of Various Disposal Methods for Unused Pharmaceuticals.
18. Shayan Sengupta. 2009: Assessing the Toxicity of Pharmaceuticals at Doses Expected from Secondary Infections Experienced During a Pandemic.
19. Genevieve Ho. 2008-2009: First project - Assessing a Thin-Film pH Biosensor. Second project – Abiotic Ammonia release from Effluent Organic Nitrogen Along Salinity Gradients.
20. Brian Harris. 2007: Assessing Oxidative Stress Response Function of Alginate-Immobilized Bacteria
21. Zachary Frye. 2006. Assessing the Feasibility of Nanostructure-Enhanced Nitrifying Microbial Fuel Cells
22. Brian Segal. 2006-2007. Evaluation of Ammonia Oxidizing Bacterial Biofilms.
23. Stephanie Harris. 2005-2006. Development of a Microfluidic Immunomagnetic Separation Biosensor for Detecting Bacterial Pathogens.
24. Beth McConnell. 2003-2004. The Affect of Physiology on Bacterial Responses to Oxidative Uncouplers
25. Suzanne Ayers. 2002. VIA Undergraduate Scholar: Evaluating the Impact of Toxic Shocks on Wastewater Treatment Performance
26. Felicia Glapion. 2001-2002. NEM-Induced Potassium Efflux in *Pseudomonas aeruginosa*
27. Monica Mace. 2000-2001. GE Scholarship: Denitrification of Aquaculture Wastewaters
28. Denise Gillam. 2000. Water Center Undergraduate Fellowship: The Impact of Potassium Efflux on Biofilm Treatment Systems Exposed to Electrophilic Toxins
29. Mike Gatza. 1999-2000. Using Two-Dimensional Gel Electrophoresis to Characterize Stress Proteins (Co-advised with Dr. Ann Stevens)
30. Bethany McRae. 1999-2000. NSF REU: Induction of the Glutathione-Gated Potassium Efflux System in *Sphingomonas capsulata* Exposed to HOCl
31. Jennifer Abrajano. 1999-2000. NSF REU: Assessing the Metabolism of Xenobiotic Compounds by Microaerobically-Grown Magnetotactic Bacteria
32. Scott Phipps. 1998-1999. Dewatering of Oily Wastewater Sludges. (Co-advised with Dr. John Novak)
33. Katya Bilyk. 1998-1999. NSF REU: Nitrite Inhibition and Toluene Degradation Under Denitrifying Conditions
34. Julie Wheeler. 1997-1998. NSF REU: Impact of Xenobiotic Stressors on Activated Sludge System Performance
35. Mary Rust. 1996-1997. Water Center Undergraduate Fellowship and NSF REU: Development and Isolation of Acetaldehyde Oxime and Methylethyl Ketoxime Degrading Cultures
36. Elliott Wheeler. 1995-1996. The Role of Various Cations in Settling and Dewatering of Biological Wastewater Treatment Sludges
37. Jon Treadway. 1995. Determination of Proteins in Activated Sludge Using Commercial Assays
38. Kevin Gilmore. Fall 1995: The Impact of Oximes on the Degree and Rate of Nitrification in Activated Sludge Cultures. Spring 1996: Evaluation of Chemical Oxidation as Pretreatment for Wastewaters Containing Aldicarb Oxime

Masters Students with Theses, Extensive Research Project, or Project Report

1. Julia Raneses. 2019 – current. Nutrient balances at the community scale.
2. Nick J. Lowe. 2018 – 2019. Toxicological monitoring of SWIFT effluent from Hampton Roads Sanitation District.

3. Avery Carlson. 2016 – 2018. Isolating and identifying comma-shaped nuisance bacteria in Traverse City's membrane bioreactor treatment system. (co-advised with Glen Daigger)
4. Enrique Rodriguez. 2016 – 2018. Plasma as a platform for advanced oxidation of urine to generate safe fertilizers (co-advised with Krista Wigginton)
5. Zixu Zhao. 2016-2017. Optimizing flushing to reduce microbial contamination of point-of-use filtered drinking water.
6. Andrea McFarland. 2015 – 2018. NSF Fellowship Recipient. Water quality benefits due to green infrastructure. (Co-advised with Larissa Larsen, Urban Planning). National Achievement: NSF Graduate Research Fellowship.
7. Samayyah Williams. 2014-2015. Modeling, understanding, and assessing technologies for the Detroit Water and Sewerage Department (DWSD) Wastewater Treatment Plant.
8. Nigel Beaton. 2014-2015. Low energy-demanding nitrogen removal from anaerobic effluents using biofilm technologies.
9. Anton Dapcic. 2013 – 2014. A performance evaluation of the WASAC™ energy recovery process.
10. Angelica Perez De La Rosa. 2010-2012. The impact of chlorinated phenols on the microbial ecology of point-of-use drinking water filters.
11. C. Davis Powell. 2011-2014. Evaluating the environmental impacts of urine source separation.
12. Chris Moline. 2010-2011. The fate of pharmaceuticals in microaerobic biological treatment processes.
13. Alexi Ernstoff. 2009 – 2011. The impact of culturing buffer on the ability of *Nitrosomonas europaea* to biotransform 17 α-ethinylestradiol. Current affiliation – Ph.D. student, Technical University of Denmark.
14. Sam Hardin. 2006-2011. The effectiveness of corrective action strategies on chemically stressed biological wastewater treatment systems. Current affiliation – environmental engineering consulting. National Achievement: WEFTEC Best Poster, 1st Place, 2008.
15. Romeo Capuno. 2005-2007. Modeling anaerobic ammonia oxidizing biofilms. Current affiliation – environmental engineering consulting.
16. Jason Beck. 2005-2007. Evaluating deammonification processes to achieve nitrogen removal from dairy waste. Current affiliation – environmental engineering consulting.
17. Jeremy Guest. 2005-2007. Laboratory testing of process controls for the mitigation of toxic shock events at enhanced biological phosphorus removal wastewater treatment plants. Current affiliation – Assistant Professor, University of Illinois.
18. Kaoru Ikuma. 2004-2007. The development of a bacterial biosensor designed to detect oxidative chemicals in water: correlating sensor relevance to mammalian brain cells and assessing bacterial cell immobilization strategies. Current affiliation – Assistant Professor, Iowa State University.
19. Mert Muftugil. 2004-2011. Enhanced Biological Phosphorus Removal of Dairy Manure using Sequencing Batch Reactors: Performance, Kinetics and Model Development. Current affiliation – environmental engineering consulting.
20. Anna Zaklikowski. 2004-2006. Evaluating the Effectiveness of Disinfection Strategies in the Inhibition and Inactivation of Ammonia Oxidizing Bacteria. Current affiliation – environmental engineering consulting.
21. Ka Man Chan. 2004-2005. Feasibility Study of In Situ Bioremediation of Bis(2-Chloroethyl) Ether and 1,2-Dichloroethane. Affiliation upon graduation – water utility.
22. Paul Sweetman. 2004-2005. Evaluating the Fate of Manure Nitrogen in Confined Dairy Waste Operations: A Full-Scale Waste Analysis and Start-up Protocol for an Anammox –Based Treatment Technology Applicable to Dairy Waste Management. Affiliation upon graduation – government position in Ireland.
23. Irina Chakraborty. (Degree from University of Helsinki, Finland) 2002-2005. Characterizing the Adaptation of a Subsurface Microbial Community using Biomolecular Tools (co-advised with Dr. Ann Stevens, Biology). Affiliation upon graduation – Ph.D. student in environmental microbiology.
24. Katharine Linares. 2002-2004. Development of a Biosensor for Detecting Toxic Electrophilic Chemicals in Waters. Current affiliation – environmental engineering consulting.

25. Jennifer Dauphinais. 2002-2003. Effects of Toxic Chemicals on Biological Wastewater Treatment Processes. Current affiliation – US government-based environmental services.
26. Rachelle Rhodes. 2002-2004. Subsurface Microbial Community Adaptation to Xenobiotic Influx. Current affiliation – environmental engineering consulting.
27. Susanna Leung. 2001-2003. Oxygen Transfer Efficiency in a Biological Aerated Filter (co-advised with John Little). Current affiliation – environmental engineering consulting.
28. Giacomo Sonzini. (Degree from Politecnico Di Milano, Italy) 2001. Investigation of K^+ Efflux as Response to Intoxication for Nitrifying Activated Sludge. Affiliation upon graduating – financial analyst in Italy.
29. Kristina Yanosek (Biological Systems Engineering). 2000-2002. Enhanced Biological Phosphorus Removal from Dairy Manure to Meet Nitrogen and Phosphorus Crop Nutrient Requirements (co-advised with Dr. Mary Leigh Wolfe). Affiliation upon graduation – US Dept of Interior.
30. David Whichard. 2000-2001. Nitrogen Removal from Dairy Manure Wastewater Using Sequencing Batch Reactors. Affiliation upon graduating – environmental services in industry.
31. Kofi Asiedu. 2000-2001. Evaluating Biological Treatment Systems: I. Moving Bed Biofilm Reactor Versus Biological Aerated Filter. II. Sulfide-Induced Corrosion in Anaerobic Digester Gas Piping. Current affiliation – Engineer III, Prince William County, Virginia.
32. Melissa Fouratt (Biological Sciences). 1998-2001. Application of Molecular Techniques to the Characterization of a Nitrifying Bioaugmentation Culture (co-advised with Dr. Ann Stevens). Position upon graduation – pharmaceutical sales.
33. Scott Phipps. 1999-2001. Performance Evaluation and Yield Determination of a Full-Scale Biological Aerated Filter. Current affiliation – environmental engineering consulting.
34. Brian Brazil. 1999-2001. Evaluation of an Effluent Treatment Strategy to Control Nitrogen from a Recirculating Aquaculture Facility. Current affiliation – environmental engineering consulting.
35. Robert Wimmer. 1998-2001. Development of a Biosensor to Predict Activated Sludge Deflocculation and the Link Between Chlorination and Potassium Efflux. Current affiliation – environmental engineering consulting.
36. Arnaud Delahaye. 1997-1998. Distribution and Characteristics of Biomass in an Upflow Biological Aerated Filter. Affiliation upon graduation – Civil servant in France.
37. Kari Husovitz. 1997-1998. The Influence of Hydraulic Loading Rate on Nitrification Performance in a Two-Stage Biological Aerated Filter Pilot System. Current affiliation – environmental engineering consulting.
38. Kevin Gilmore. 1997-1999. Using Oligonucleotide Probes to Characterize Nitrification in a Two-Stage Pilot Plant Scale Biological Aerated Filter System. Current affiliation – Associate Professor, Bucknell University.
39. Jeff McGinnis. 1996-2003. Biodegradation and Dewatering of an Industrial Waste Oil. Current affiliation – environmental engineering consulting.
40. Jennifer Phillips. 1996-1997. Denitrification or Recirculating Aquaculture System Waters Using an Upflow Biofilter and a Fermented Substrate. Current affiliation – environmental engineering consulting.
41. Kristina Perri. 1996-1997. The Effectiveness of Multiple Redox Treatment Strategies on the Treatability of a High Strength Industrial Wastewater. Current affiliation – environmental engineering consulting.
42. James Drew Fettig. 1995-1998. A Study of the Patterns, Stoichiometry, and Kinetics of Microbial BTX Degradation Under Denitrifying Conditions by an Activated Sludge Consortium Receiving a Mixed Waste. Current affiliation – environmental engineering consulting.
43. Michelle Smith. 1995-1996. The Effect of Cation Addition on the Settling and Dewatering Properties of an Industrial Activated Sludge. Affiliation upon graduation – environmental engineering consulting in Canada.
44. Erika Lubkowicz (Bailey). 1995-1996. Biological Treatment Schemes for Preventing Oxime Inhibition of Nitrification. Current affiliation – environmental engineering consulting.

45. Patrick Brooks. 1995-1996. An Investigation of Temperature Effects on Denitrifying Bacterial Populations in a Biological Nutrient Removal System. Current affiliation – environmental engineering consulting.

Ph.D. Dissertations, Student Placement and Nationally Recognized Achievements by Mentees

1. Brittany Brown Hicks. 2019 – 2024 (anticipated). Project being defined. *National Achievement*: Ford Foundation Predoctoral Fellowship.
2. Alyssa Schubert. 2018 – 2023 (anticipated). Crowd-sourced water quality monitoring and community access to water monitoring.
3. Lucinda Li. 2018 – 2023 (anticipated). The impact of urine derived fertilizers on soil health (co-advised with Krista Wigginton).
4. Enrique Rodriguez. 2018 – 2022 (anticipated). Suspect screening, effect directed analysis and chemical risk of resource efficiency processes (co-advised with Krista Wigginton).
5. Hollie Adejumo. 2017 – 2022 (anticipated). The Toxicity and Transformation of Nitrogenated Disinfection Byproducts in the Human Gut (co-advised withi Laura Rozek). *National Achievement*: NSF Graduate Research Fellowship.
6. Avery Carlson. 2018 – 2021 (anticipated). Project topic being developed (co-advised with Glen Daigger)
7. Brett Wagner. 2016 – 2021 (anticipated). Membrane aerated biofilm reactor technology (co-advised with Glen Daigger). *National Achievement*: NSF Graduate Research Fellowship.
8. Sara Troutman. 2015-2020. Integrated urban water infrastructure systems modeling at the green and grey infrastructure interface. (co-advised with Branko Kerkez). *Current Affiliation*: Xylem, Inc. *National Achievement*: NSF Graduate Research Fellowship.
9. Zerihun Bekele Alemayehu. 2015-2020. Use of sensor-mediated controls to achieve enhanced, low energy nitrogen removal during mainstream wastewater treatment. (Co-advised with Charles Bott, Hampton Roads Sanitation District). *Current Affiliation: Engineer with BASF Corporation.*
10. Chia-Chen Wu. 2013- 2018. Bacterial colonization of point-of-use (PoU) drinking water filters, selection of opportunistic pathogens and presence of antibiotic resistance genes. (Co-advised with Terese Olson). *Current Affiliation*: Postdoctoral Research Associate, Wayne State University
11. Heather Goetsch. 2014 –2018. Evaluating the benefits and risks of source separation as a nutrient management strategy. (Co-advised with Krista Wigginton). *Current Affiliation:* Department of Energy. *National Achievement*: AAAS Fellow with the Dept of Energy.
12. Jeseth Delgado-Vela. 2012 –2018. NSF Fellowship Recipient and Ford Foundation Fellow. Nitrogen and Sulfur Cycling During Wastewater Treatment. (Co-advised with Greg Dick). *Current Affiliation:* Assistant Professor, Howard University, Washington D.C. *National Achievements:* NSF Graduate Research Fellowship; Ford Foundation Fellowship; AEESP Conference Best Student Presentation.
13. Lauren Stadler. 2010 – 2015. Fate of trace contaminants in bacterial communities under low dissolved oxygen environments. *Current Affiliation:* Assistant Professor, Rice University, Houston. *National Achievement:* NSF Graduate Research Fellowship; 2016 CH2M/AEESP Best Dissertation Award; AEESP Conference Best Student Presentation.
14. Sherri M. Cook. 2008-2014. Sustainable Waste Management: Modeling and Decision Strategies for Unused Medications and Wastewater Solids (Co-advised with Steve Skerlos). *Current Affiliation:* Assistant Professor, University of Colorado, Boulder. *National Achievement:* NSF Graduate Research Fellowship
15. Jeremy S. Guest. 2007-2012. Sustainable design of wastewater treatment systems: Evaluations of operational flexibility and phototrophs for resource recovery. (Co-advised with Steve Skerlos). *Current Affiliation:* Associate Professor, University of Illinois, Urbana-Champaign. *National Achievements:* 2014 NSF CAREER Award Recipient; 2016 Paul L. Busch Award, Water Research Foundation.
16. Ameet J. Pinto. 2005-2009. Upset Events at Wastewater Treatment Plants: Implications for Mitigative Strategy Development and Bioreactor Microbial Ecology. *Current Affiliation:* Assistant Professor, Northeastern University, Boston. *National Achievements*: 2018 NSF CAREER Award Recipient; 2018 ISME/IWA Rising Star Bio Cluster Award; 2019 Paul L. Busch Award, Water Research Foundation .

17. Wendell Khunjar. 2004-2009. Elucidating Factors that Impact the Removal of Organic Microconstituents by Heterotrophic and Ammonia Oxidizing Bacteria. *Current Affiliation:* Hazen and Sawyer Consultants.
18. Martin Musabyimana. 2005-2008. Deammonification Process Kinetics and Inhibition Evaluation. *Current Affiliation:* East Bay Municipal Utility District, San Francisco, CA.
19. Kevin R. Gilmore. 2005-2008. Treatment of High-Strength Nitrogen Wastewater With a Hollow-Fiber Membrane-Aerated Biofilm Reactor: A Comprehensive Evaluation. *Current Affiliation:* Associate Professor, Bucknell University.
20. Jocelyn Fraga Muller. 2002-2006. The Role of Multidrug Efflux Pumps in the Stress Response of *Pseudomonas aeruginosa* to Organic Contamination. (Co-advised with Ann Stevens) *Current Affiliation:* Community College Instructor.
21. Ines D. S. Henriques. 2001-2006. The Response of Activated Sludge Cultures to Toxic Chemicals: Process Performance Effects, Role of Floc Structure, and Detection of Physiological Changes by Footprinting Methods. *Current Affiliation:* Business CEO, Portugal. National Achievement: WEFTEC Best Poster 1st Place, 2003.
22. Richard T. Kelly II. 2001-2005. Chemical Inhibition of Nitrification: Evaluating Methods to Detect and Characterize Inhibition and the Role of Selected Stress Responses Upon Exposure to Oxidative and Hydrophobic Toxins. *Current Affiliation:* Brown and Caldwell, Seattle, Washington.
23. R. David Holbrook. 2000-2003. The Role of Colloids in Defining the Fate of Endocrine System Disrupting Chemicals in Wastewater Treatment Systems (Co-advised with Dr. John Novak). *Current Affiliation:* Chief, Surface and Microanalysis Sciences Division, National Institute of Standards and Technology. *National Achievement:* 2010 PECASE (Presidential Early Career Award for Scientists and Engineers) recipient.
24. Charles B. Bott. 1997-2001. Elucidating the Role of Toxin-Induced Microbial Stress Responses in Biological Wastewater Treatment Process Upset. Affiliation upon graduation: environmental engineering consulting, then Assistant and Associate Professor at Virginia Military Institute. *Current Affiliation:* Director of Water Technology and Research, Hampton Roads Sanitation District, Virginia. *National Achievements*: Parsons Engineering Science/AEESP Doctoral Thesis Award; AEESP Fred Pohland Medal.
25. Guihua Ma. 1995-1999. The Kinetics, Biochemical Patterns, and Microbial Ecology in Multiredox Activated Sludge Systems Treating BTX Containing Wastewater. *Current Affiliation:* KCI, Inc., Baltimore, MD.

Post-Doctoral Research Associates

1. William Tarpeh, 2017-2018. Pharmaceutical transformation products through urine-derived fertilizer processing technologies. Co-advised with K. R. Wigginton. *Current Affiliation: Assistant Professor of Chemical Engineering, Stanford University.*
2. Rebecca Lahr, 2015-2016. Microbial fate in source-separated urine. Co-advised with K. R. Wigginton. *Prior Affiliation*: Assistant Professor, Michigan State University.
3. Dr. Kelly Martin. 2013 – 2015. Innovative, Low Energy Nitrogen Removal from Anaerobic Effluents. *Current Affiliation:* Black and Veatch, Inc.
4. Dr. Sudeshna Ghosh. 2008-2012. Chemical stressor-induced antibiotic resistance. *Current Affiliation:* Self Employed.
5. Dr. Kartik Chandran. 2004-2005. Chemical stress mechanisms in nitrifying bacteria. *Current Affiliation:* Associate Professor, Columbia University. *National Achievements:* NSF CAREER Award recipient; 2015 MacArthur Fellow; 2010 Paul L. Busch Award, Water Research Foundation.
6. Dr. Jane Duncan. 1998-1999. Heat shock protein expression in response to chemical stress in activated sludge. *Current Affiliation:* Research Scientist, Dept of Biochemistry, Virginia Tech.
7. Dr. Kathy Terlesky. 1996-1997. Heat shock protein expression in response to chemical stress in activated sludge. Current Affiliation: Vice President, Division Manager, SAIC, Inc., Charlottesville, Virginia.

PUBLICATIONS

Textbooks

1. Grady, C. P. L. Jr., G. T. Daigger, N. G. Love and C. Filipe. 2011. *Biological Wastewater Treatment*, 3rd Edition, Taylor and Francis Publishers.

Peer-Reviewed Journal Articles (undergraduate students; graduate students; post-doctoral research associates; *corresponding or senior author)

2. Wigginton, K. R., P. J. Arts, H. Clack, W. J. Fitzsimmons, M. Gamba, K. R. Harrison, W. LeBar, A. S. Lauring, L. Li, W. W Roberts, N. Rockey, J. Torreblanca, C. Young, L. G. Anderegg, A. M. Cohn, J. M. Doyle, C. M. Meisenhelder, L. Raskin, N. G. Love*, and K. S. Kaye*. 2021. Validation of N95 filtering facepiece respirator decontamination methods available at a large university hospital. *Open Forum Infectious Diseases*. Accepted. DOI: 10.1093/ofid/ofaa610.
3. Delgado-Vela, J., L. A. Bristow, H. K. Marchant, N. G. Love and G. J. Dick*. 2021. Sulfide alters microbial functional potential in a methane and nitrogen cycling biofilm reactor. *Environmental Microbiology*. Accepted.
4. Hilton*, S., G. Keoleian, G. T. Daigger, B. Zhou, N. G. Love. 2021. Life-cycle assessment of urine diversion and conversion to fertilizer products at the city scale. *Environmental Science & Technology*. 55:593-603.
5. Anderegg, L., J. Doyle, M. L. Gardel, A. Gupta, C. Hallas, Y. Lensky, N. G. Love, B. A. Lucas, E. Mazenc, C. Meisenhelder, A. Pillarisetti, D. Ranard, A. H. Squires, J. Vechakul, N. B. Vilas, S. Williams, D. Wilson, *Chen, T. and the N95DECON consortium. 2021. Heat and humidity for bioburden reduction of N95 filtering facepiece respirators. *Applied Biosafety*. In press. DOI:10.1089/apb.20.0053.
6. Rockey, N., P.J. Arts, L. Li, K.R. Harrison, K. Langenfeld, W.J. Fitzsimmons, A.S. Lauring, N.G. Love, K.S. Kaye, L. Raskin, W.W. Roberts, B. Hegarty, K.R. Wigginton*. 2020. Humidity and deposition solution play a critical role in virus inactivation by heat treatment on N95 respirators. *mSphere*. 5(5):e00588-20. DOI:10.1128/mSphere.00588-20.
7. Admassu Abate, T., A. F. Desta, F. Assefa, N. G. Love*. 2020 The performance of an Ethiopian tannery wastewater treatment system based on chemical and microbiological water quality. *Water Environment Research*. In press. DOI:10.1002/wer.1364.
8. Segrè Cohen*, A., N. G. Love, J. Árvai. 2020. Communicating the risks and benefits of human urine-derived fertilizer. *Sustainability*. **12**(23): 9973. DOI:10.3390/su12239973.
9. Troutman, S. C., N. G. Love and B. Kerkez*. 2020. Balancing water quality and flows in combined sewer systems using real-time control. *Environmental Science: Water Research & Technology*. **6**:1357-1369. DOI: 10.1039/c9ew00882a.
10. Schreiber*, T., S. Opperman, K. Nace, A. N. Pallmeyer, N. Love and R. Hardin. 2020. Leveraging integrative research for inclusive innovation: urine diversion and re-use in agriculture. *Elementa Science of the Anthropocene*. **8**:12. doi.org/10.1525/elementa.408
11. Cohen, A. S.*, N. G. Love, K. K. Nace and J. Arvai. 2020. Consumers' acceptance of agricultural fertilizers derived from diverted and recycled human urine. *Environmental Science & Technology*. **54**(8):5297-5305. 10.1021/acs.est.0c00576.
12. Carlson, A. L., G. T. Daigger*, N. G. Love and E. Hart. 2020. Multi-year diagnosis of unpredictable fouling occurrences in a full-scale membrane bioreactor. *Water Science and Technology*. **82**(3):524-536. DOI: 10.2166/wst.2020.354.
13. Bekele, Z. A., J. Delgado Vela, C. B. Bott, N. G. Love*. 2020. Sensor-mediated granular sludge reactor for nitrogen removal and reduced aeration demand using a dilute wastewater. *Water Environment Research*. **92**(7):1006-1016. DOI: 10.1002/wer.1296. *Honor: Editor selected for issue cover art*
14. Goetsch, H. E., N. G. Love, K. R. Wigginton*. 2020. Fate of extracellular DNA in the production of fertilizers from source-separated urine. *Environmental Science & Technology*.**54** (3):1808-1815. DOI:10.1021/acs.est.9b04263.
15. Brown, M., F. Karimova, N. Love, K. Pagilla, C. Bott, Z. He, B. Liner and S. Merther. 2020. University-utility partnerships: Best practices for water innovation and collaboration. *Water Environment Research*. **92**(3):314-319. DOI:10.1002/wer.1252.

16. Brouwer, A. F., M. C. Eisenberg, N. G. Love, J. N. S. Eisenberg*. 2019. Phenotypic variations in persistence and infectivity between and within environmentally transmitted pathogen populations impact population-level epidemic dynamics. *BMC Infectious Diseases*, **19**(1):449-461. DOI:10.1186/s12879-019-4054-8.

17. Daigger*, G. T., S. Sharvelle, M. Arabi, N. G. Love. 2019. Progress and Promise Transitioning to One Water/Resource Recovery Integrated Urban Water Management Systems. *Journal of Environmental Engineering.* **145** (10), 10 pages. DOI: 10.1061/(ASCE)EE.1943-7870.0001552. *Recipient of the ASCE Wesley W. Horner Award.*

18. McFarland, A. R., L. Larsen*, K. Yeshitela, A. N. Engida and N. G. Love. 2019. Guide for using green infrastructure in urban environments for stormwater management. *Environmental Science: Water Research & Technology*, **5**(4):643-659. DOI:10.1039/C8EW00498F.

19. Liang, S., S. Qu, Q. T. Zhao, X. L. Zhang, G. T. Daigger, J. P. Newell, S. A. Miller, J. X. Johnson, N. G. Love, L. X. Zhang, Z. F. Yang, M. Xu*. 2019. Quantifying the urban food-energy-water nexus: The case of the Detroit Metropolitan Area. *Environmental Science & Technology*, **53**(2):779-788. DOI:10.1021/acs.est.8b06240.

20. Stadler, L. B. and N. G. Love*. 2019. Oxygen half-saturation constants for pharmaceuticals in activated sludge and microbial community activity under varied oxygen levels. *Environmental Science & Technology.* **53**(4):1918-1927. DOI:10.1021/acs.est.8b06051.

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24. Goetsch, H. E., L. B. Zhao, M. Gnegy, M. J. Imperiale, N. G. Love, K. R. Wigginton*. 2018. The fate of urinary tract virus BK human polyomavirus in source-separated urine. *Applied and Environmental Microbiology*, **84**(7): DOI:10.1128/AEM.02374-17.

25. Stadler, L. B.†, J. Delgado Vela†, S. Jain, G. J. Dick, and N. G. Love*. 2017. Elucidating the impact of microbial community biodiversity on pharmaceutical biotransformation during wastewater treatment. *Microbial Biotechnology*, **11**(6):995-1007. DOI: 10.1111/1751-7915.12870. †These authors contributed equally to this work.

26. Mullen, R. A., K. R. Wigginton, A. Noe-Hays, K. Nace, N. G. Love, C. B. Bott and D. S. Aga*. 2017. Optimizing extraction and analysis of pharmaceuticals in human urine, struvite, food crops, soil, and lysimeter water by liquid chromatography-tandem mass spectrometry. *Analytical Methods.* **9**(41):5952-5962.

27. Troutman, S. C., N. Schambach, N. G. Love and B. Kerkez*. 2017. A self-calibrating framework for the sensor-driven and dynamical modeling of combined sewer systems. *Water Research*, **126**:88-100. DOI: 10.1016/j.watres.2017.08.065

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31. Lahr, R.H., H. E. Goetsch, S. J. Haig, A. Noe-Hays, N. G. Love, D. S. Aga, C. B. Bott, B. Foxman, J. Jimenez, T. Luo, K. Nace, K. Ramadugu and K. R. Wigginton*. 2016. Urine bacterial community

convergence through fertilizer production: storage, pasteurization, and struvite precipitation. *Environmental Science and Technology*, **50**(21):11619-11626.

32. Lester, Y., D. Aga, N. G. Love, R. Singh, I. Morrissey and K. Linden*. 2016. Integrative advanced oxidation and biofiltration for treating pharmaceuticals in wastewater. *Water Environment Research*. **88**(11):1985-1993. DOI:10.2175/106143016X14504669767454
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35. Delgado Vela, J., L. B. Stadler, K. J. Martin, L. Raskin, C. B. Bott and N. G. Love*. 2015. Prospects for biological nitrogen removal from anaerobic effluents during mainstream wastewater treatment. *Environmental Science and Technology Letters*, **2**(9):234-244. **DOI:** 10.1021/acs.estlett.5b00191.
36. Muller, J. F., S. Ghosh, K. Ikuma, A. M. Stevens and N. G. Love*. 2015. Chlorinated phenol-induced physiological antibiotic resistance in *Pseudomonas aeruginosa*. *FEMS Microbiology Letters*, **362**(21):fnv172, DOI: 10.1093/femsle/fnv172.
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Refereed Conference Presentations (presenter in bold)

145. **Hicks, B.**, C. C. Wu, M. B. Perri, Z. Zhao, M. Zervos, S. P. McElmurry, N. G. Love. Isolating and characterizing *Stenotrophomonas maltophilia* from drinking water point-of-use filters in an aged distribution system. Poster presentation. International Water Association Microbial Ecology of Water Engineering (MEWE) Biannual Conference, Hiroshima, Japan, November 17-20, 2019.

146. **Love, N. G.** The International Water Association Specialists Group on Environmental Engineering Education: History and Background. Podium Presentation for pre-conference workshop. International Water Association Microbial Ecology of Water Engineering (MEWE) Biannual Conference, Hiroshima, Japan, November 17-20, 2019

147. Love, N.G., A. Noe-Hays, D. Aga, J. Arvai, A. Cohen, **G. Daigger**, A. Davis, R. Dickman, R. Hardin, S. Hilton, G. Keoleian, L. Li, N. Lowe, R. Mullen, K. Nace, E. Rodriguez, T. Schreiber, S. Skerlos, W. Tarpeh, K. Wigginton. Achieving Nutrient Resource Efficiency through Urine Separation, Processing and Reuse: A Comprehensive Study. Podium Presentation. 3rd IWA Resource Recovery Conference, Venice, Italy, September 2019.

148. **Carma Lewis***, Elizabeth Burtch*, Nick J. Lowe, Audrey Rose Zarb, **Alyssa Schubert**, Janée Rankin*, Lydia Starrs*, Rochelle Kelly*, Richard Kelley*, Alyssa Schubert, Enrique Rodriguez, Lucinda Li, Audrey Pallmeyer, Shawn P. McElmurry, Nancy G. Love *(*community collaborators from Flint, Ms. Lewis and Ms. Schubert gave the talk)*. Community-driven Train-the-Trainers program for point-of-use

filter maintenance in communities affected by drinking water lead contamination. Podium Presentation. Association of Environmental Engineering and Science Professors Biannual Conference, Arizona State University, Tempe, Arizona. May 15-16, 2019.

149. **Tarpeh, W.**, Y. Du, C. Carpenter, D. Helbling, N. G. Love, K. R. Wigginton. Suspect screening of pharmaceuticals during urine treatment processes. Podium Presentation. Association of Environmental Engineering and Science Professors Biannual Conference, Arizona State University, Tempe, Arizona. May 15-16, 2019.

150. **Goetsch, H.**, L. Li, N. G. Love and K. R. Wigginton. Understanding microbial agents in source-separated urine for the production of urine-derived fertilizers. Podium Presentation. Association of Environmental Engineering and Science Professors Biannual Conference, Arizona State University, Tempe, Arizona. May 15-16, 2019.

151. A. Noe-Hays, A. Davis, N. J. Lowe, J. Eraci, Y. J. Ooi, A. Sabido, K. Nace, E. Rodriguez, K. Wigginton, **N. Love**. Onsite production of concentrated urine-derived fertilizer in building-scale systems using remote process monitoring and control. Poster Presentation. Association of Environmental Engineering and Science Professors Biannual Conference, Arizona State University, Tempe, Arizona. May 15-16, 2019.

152. Kerkez, B., N. G. Love, **R. L. McCaffery**, M. Bartos, J. Montgomery, E. TerBeek. A First Year College Course on Smart Water Systems. Poster Presentation. Association of Environmental Engineering and Science Professors Biannual Conference, Arizona State University, Tempe, Arizona. May 15-16, 2019.

153. Cohen, A. S., **N. G. Love**, J. Árvai. Consumers' preferences and perceptions regarding the use of urine-derived fertilizer for domestic agriculture. Poster Presentation. Association of Environmental Engineering and Science Professors Biannual Conference, Arizona State University, Tempe, Arizona. May 15-16, 2019.

154. **Pallmeyer, A. and N. G. Love.** Achieving Resource Efficiency with Resource Recovery: Introduction the NSF INFEWS Project on Urine-Derived Fertilizers. Podium Presentation. 91st Annual Water Environment Federation Technical Exhibition and Conference, New Orleans, LA, October 1-3, 2018.

155. **Bekele, Z.**, J. Delgado Vela, C. B. Bott, N. G. Love. Sensor-mediated Control for Aerobic Granular Sludge Process Treating Mainstream Anaerobic Effluent. Podium presentation. 91st Annual Water Environment Federation Technical Exhibition and Conference, New Orleans, LA, October 1-3, 2018.

156. **Troutman, S.C.**, N. G. Love and B. Kerkez. Evaluating market-based algorithms for system-level TSS control. 13th International Conference on Hydroinformatics. Palermo, Italy, July 1-6, 2018.

157. **Troutman, S. C.**, N. G. Love and B. Kerkez. Market-based real-time control of TSS across large sewer systems. World Environmental & Water Resources Congress, EWRI. Minneapolis, MN, USA. June 3-7, 2018.

158. **Tarpeh, W.**, D. S. Aga, N. G. Love, K. Wigginton. Assessing Risks from Pharmaceuticals and Transformation Products in Urine-Derived Fertilizers. Podium presentation. American Chemical Society Annual Meeting. New Orleans, LA. March 2018.

159. **Troutman, S.C.**, N. G. Love and B. Kerkez. Evaluating market-based algorithms for system-level TSS control. Podium presentation. 13th International Conference on Hydroinformatics. Palermo, Italy, July 1-6, 2018.

160. **Wagner, B.**, G. T. Daigger, N. G. Love. Partial nitritation/anammox membrane aerated biofilm reactor for nitrogen removal from aerobic secondary effluent. Podium presentation. Water Environment Federation Nutrient Removal and Recovery Conference, Raleigh North Carolina, June 18-21, 2018. Presentation with associated conference paper.

161. **Love, N. G.**, A. Noe-Hays, K. R. Wigginton, L. Macpherson, D. S. Aga, C. B. Bott, G. T. Daigger, A. P. Davis, J. Eisenberg, A. Gagnon, Z. Getaneh, H. Goetsch, P. Gooding, R. Hardin, S. Hilton, J. Jimenez, G. Keoleian, N. J. Lowe, W. Mui, R. Mullen, K. Nace, A. Pallmeyer, N. Patel, D. Raye-Leonard, E. E. Rodriguez, T. Schreiber, A. Sinanaj, W. Tarpeh, R. Wombacher, B. Zhou. Advancing Nutrient Recovery through Urine-Derived Fertilizers (UDF) in the United States. Podium presentation. Water

Environment Federation Nutrient Removal and Recovery Conference, Raleigh North Carolina, June 18-21, 2018. Presentation with associated conference paper.

162. **Troutman, S. C.**, N. G. Love and B. Kerkez. Market-based real-time control of TSS across large sewer systems. Podium presentation. World Environmental & Water Resources Congress, EWRI. Minneapolis, MN, USA. June 3-7, 2018.

163. **Rodriguez, E.**, W. Tarpeh, H. Clack, N. G. Love, K. Wigginton. 2018. Degradation of pharmaceuticals in synthetic urine treated with plasma. Poster Presentation. American Chemical Society Meeting, New Orleans, LA, March 18-22, 2018.

164. **Zerihun A. Bekele**, Imre Takacs, Charles B. Bott, and Nancy G. Love. Harnessing biofilm models to advance nitrogen removal from mainstream anaerobic wastewater treatment processes. Poster presentation. WRRMod2018 conference, Quebec, Canada, March 2018.

165. **Tarpeh, W.**, D. S. Aga, N. G. Love, K. Wigginton. Assessing Risks from Pharmaceuticals and Transformation Products in Urine-Derived Fertilizers. Podium presentation. American Chemical Society Annual Meeting. New Orleans, LA. March 2018.

166. **Carlson, A.**, N. G. Love, G. T. Daigger and E. Hart. Trouble-shooting long-term biofouling in full-scale membrane bioreactor. International Water Association Young Water Professionals Conference, South Africa. December 10-14, 2017.

167. **Goetsch, H.E.**, Love, N.G., Imperiale, M.J., Wigginton, K. Fate of Human BK polyomavirus through urine diverted for fertilizer. 2nd International Resource Recovery Conference: New York City, NY, USA August 5-9, 2017.

168. **Delgado Vela, J.**, Dick, Gregory J., Love, N.G. The Impact of Sulfide on Nitrification: Implications for Nitritation Processes. Fifth International Conference on Nitrification and Related Processes (ICoN5): Early Career and Graduate Student Workshop. Vienna, Austria, July 23-27, 2017.

169. **Zerihun A. Bekele**, Jeseth Delgado Vela, Kelly J. Martin, Charles B. Bott, and Nancy G. Love. Using sensor-mediated control and modeling to develop an aerobic granular sludge technology for low energy nitrogen. Podium presentation. AEESP Biannual Conference, Ann Arbor, Michigan, June 20-22, 2017.

170. **Troutman, S. C.**, N. G. Love, B. Kerkez. 2017. Controlling a Sewer Network as an Extension of the Wastewater Treatment Plant. Podium presentation. AEESP Biannual Conference, Ann Arbor, Michigan, June 20-22, 2017

171. **Chia-Chen Wu**, Katie Stroh, Shawn P. McElmurry, Terese M. Olson, and Nancy G. Love. Understanding the transmission of planktonic and sessile bacteria across point-of-use (PoU) filters. Podium presentation. AEESP Biannual Conference, Ann Arbor, Michigan, June 20-22, 2017

172. **Delgado Vela, J.**, Dick, Gregory J., Love, N.G. Managing Healthy Activated Sludge Communities: Understanding the Impact of Sulfide on Nitrogen Removal. Podium presentation. AEESP Biannual Conference, Ann Arbor, Michigan, June 20-22, 2017

173. **Bekele, Z. A.**, Jeseth Delgado Vela, Kelly J. Martin, Charles B. Bott, and Nancy G. Love. Aerobic granular sludge process optimization and modeling for mainstream anaerobically treated wastewater. Poster presented at IWA Biofilm Reactors Conference, Dublin. Ireland, May 2017

174. **Troutman, S. C.**, N. G. Love, B. Kerkez. 2017. Understanding Combined Sewer Flow Dynamics through Data-Driven Modeling. World Environmental & Water Resources Congress, EWRI. Sacramento, CA, USA. May 21-25 2017.

175. **Zerihun A. Bekele**, Jeseth Delgado Vela, Kelly J. Martin, Charles B. Bott, and Nancy G. Love. Aerobic granular sludge process optimization and modeling for mainstream anaerobically treated wastewater. Poster presented at IWA Biofilm Reactors Conference, Dublin. Ireland, May 2017

176. **Goetsch, H.**, M. Imperiale, N. G. Love, K. R. Wigginton. 2017. Fate of human polyomavirus in urine diverted for fertilizer use. American Chemical Society 253rd National Meeting, San Francisco, CA, April 2017.

177. **Goetsch, H.**, M. Imperiale, N. G. Love, K. R. Wigginton. Refining liquid gold: Fate of human polyomavirus in urine diverted for fertilizer use. Oral presentation. Borchardt conference, Ann Arbor, Michigan, February 2017.

178. **Troutman**, S., N. G. Love, B. Kerkez. Use of Real-Time Sensor Data in City-Scale Water Modeling. Poster presentation presented at two different conferences: Borchardt conference, Ann Arbor, Michigan, February 2017; and CUAHSI Biennial Symposium

179. **Zhao, Z.**, M. P. Runho, C.-C. Wu, A. Zarb, T. M. Olson, S. P. McElmurry, and Nancy G. Love. 2017 Effect of flushing on microbiological quality of water effluent from point-of-use filters. Poster presentation, Borchardt conference, Ann Arbor, Michigan, February 2017.

180. **Alemayehu, Z.**, C. B. Bott and N. G. Love. 2017. Achieving nitrogen removal from mainstream anaerobically treated wastewater using aerobic granular sludge with low aeration rate. Poster presentation, Borchardt conference, Ann Arbor, Michigan, February 2017.

181. **Delgado Vela, J.**, Z. A. Bekele, A. McFarland, A. Arcelay, K. J. Martin, C. B. Bott, G. J. Dick and N. G. Love. 2016. The membrane aerated biofilm reactor for nitrogen removal from mainstream anaerobic processes. 89th Annual Water Environment Federation Technical Exhibition and Conference (WEFTEC), New Orleans, LA, Sept 25-28, 2016.

182. **Desta, A. F.**, N. G. Love, K. R. Wigginton, H. Goetsch and R. Lahr. 2016. Keynote lecture: Metagenomic analysis of biological contaminants in source-separated urine undergoing sanitization.: A way towards sustainable development in low-income countries. Microbial Ecology and Biofilm Specialists Conference, Copenhagen, Denmark, Sept 3-5, 2016.

183. **Stadler, L.** and N. G. Love. 2016. Associations between microbial community activity, pharmaceutical biotransformation rates, and DO concentration in wastewater treatment. Microbial Ecology and Biofilm Specialists Conference, Copenhagen, Denmark, Sept 3-5, 2016.

184. **Goetsch, H.**, M. Imperiale, N. G. Love and K. R. Wigginton. 2016. Refining liquid gold: Fate of human polyomavirus in urine diverted for fertilizer use. Microbial Ecology and Biofilm Specialists Conference, Copenhagen, Denmark, Sept 3-5, 2016.

185. **Wu, C.-C.**, T. M. Olson and N. G. Love. 2016. Prevalence of Antibiotic Resistance Genes (ARGs) in Point-of-Use (PoU) Drinking Water Filters. Microbial Ecology and Biofilm Specialists Conference, Copenhagen, Denmark, Sept 3-5, 2016.

186. **Troutman**, S., N. G. Love, B. Kerkez. 2016. Predicting combined sewer flow through use of real-time, city-scale sensor data. Oral presentation, World Environmental and Water Resources Congress, ASCE, West Palm Beach, Florida, May 2016.

187. **Goetsch, H.**, R. Mullen, R. Lahr, A. Noe-Hays, D. Aga, C. Bott, B. Foxman, J. Jimenez, N. Love, T. Luo, K. Nace, K. Ramadugu, K. Wigginton. 2015. Fate of pharmaceutical and biological contaminants through the preparation and application of urine derived fertilizers. International Water Association First Resource Recovery Conference. Ghent, Belgium, Aug 30-Sept 2, 2015.

188. **Delgado Vela, J.**, Martin, K. J., McFarland, A., Beaton, N., Stadler, L.B., Skerlos, S.J., Raskin, L., Bott, C. B., Love, N.G. Removing nitrogen from effluents of anaerobic wastewater treatment processes: Understanding control and operation through biofilm modeling. 250th American Chemical Society National Meeting and Exhibition. Boston, MA, August 16-20, 2015. (podium).

189. **Delgado Vela, J.**, K. J. Martin, A. R. McFarland, N. L. Beaton, L. B. Stadler, C. B. Bott, L. Raskin, S. J. Skerlos, N. G. Love, A. Salveson, T. Rauch-Williams. 2015. Advancing energy neutral wastewater treatment: removing nitrogen and dissolved methane from dilute anaerobic effluents. AEESP Biannual Conference, Yale University, June 14-16 (poster presentation).

190. **Stadler, L. B., J. Delgado Vela** and N. G. Love. 2015. Elucidating the relationship between wastewater treatment plant microbial diversity and pharmaceutical fate. AEESP Biannual Conference, Yale University, June 14-16 (podium presentation), *winner of best student paper award.*

191. **Goetsch, H., R.**, Lahr, R. Mullen, A. Noe-Hays, D. Aga, C. B. Bott, J. Jimenez, N. G. Love, K. Nace and K. Wigginton. 2015. Fate or organic contaminants in urine-derived fertilizers. AEESP Biannual Conference, Yale University, June 14-16 (poster presentation).

192. **Lahr, R., H.**, Goetsch, A. Noe-Hays, D. Aga, C. B. Bott, B. Foxman, J. Jimenez, N. G. Love, T. Luo, R. Mullen, K. Nace, K. Ramadugu and K. Wigginton. 2015. Microbial communities in urine separated for nutrient recovery. AEESP Biannual Conference, Yale University, June 14-16 (poster presentation).

193. **Stadler, L. B.**, J. Delgado Vela and N. G. Love. 2015. Elucidating the relationship between wastewater treatment plant microbial diversity and pharmaceutical fate. American Society for Microbiology, New Orleans, LA, May 30-June 2 (Poster Presentation).

194. **Goetsch, H.**, R. Lahr, A. Desta, N. G. Love, C. Bott, A. Gagnon, K. Nace, A. Noe-Hays, D. S. Aga, R. Mullen, J. Jimenez, K. Wigginton, 2015. Fate of pharmaceutical and biological contaminants through the preparation and application of urine-derived fertilizers. 88th Annual Water Environment Federation Technical Exhibition and Conference (WEFTEC), Chicago, IL, Sept 27-30, 2015.

195. **Stadler, L.**, J. Delgado Vela and N. G. Love. 2015. Impact of low dissolved oxygen and microbial community on pharmaceutical biotransformations during wastewater treatment. 88th Annual Water Environment Federation Technical Exhibition and Conference (WEFTEC), Chicago, IL, Sept 27-30, 2015.

196. **Delgado-Vela, J.**, K. J. Martin, N. Beaton, A. McFarland, L. B. Stadler, C. B. Bott, S. J. Skerlos, L. Raskin, N. G. Love. 2015. Nutrient removal from mainstream anaerobic processes using a membrane aerated biofilm reactor and a granular sludge sequencing batch reactor. 88th Annual Water Environment Federation Technical Exhibition and Conference (WEFTEC), Chicago, IL, Sept 27-30, 2015.

197. **Delgado Vela J.**, Martin, K. J., Beaton, N., McFarland, A., Stadler, L., Bott, C. B., Raskin, L., Skerlos, S.J., and Love, N.G. 2014. Nitrogen Removal Downstream of an Anaerobic Membrane Bioreactor for Domestic Wastewater Treatment. IWA Global Challenges: Sustainable Wastewater Treatment and Resource Recovery. Kathmandu, Nepal, October 26-30.

198. **Delgado Vela, J.**, Martin, K.J., Stadler, L.B., Bott, C. Skerlos, S.J., Raskin, L,. Love, N.G., 2014. Nutrient Removal from Mainstream Anaerobic Effluents: Linking Biofilm Modeling to Experimental Design. 87th Annual Water Environment Federation Technical Exhibition and Conference (WEFTEC), New Orleans, LA, September 28-October 1. (poster presentation)

199. **Stadler, L. B.**, Su, L., Aga, D. S., and Love, N. G. 2014. Understanding the impact of low dissolved oxygen treatment on nitrifier community characteristics and micropollutant fate. 4th International Conference on Occurrence, Fate, Effects, and Analysis of Emerging Contaminants in the Environment. Iowa City, IA, August 19 – 22, 2014.

200. **Love, N. G.** 2014. Achieving resilience and sustainability in the global urban water sector – a role for environmental chemistry. Special Seminar Series: Women in Environmental Chemistry and Engineering, Abstract 312-ENVR, 248th American Chemical Society National Meeting. San Francisco, CA, August 10-14. (podium presentation)

201. **Stadler, L. B.**, Su, L., Aga, D. S., and Love, N. G. 2014. Understanding the impact of low dissolved oxygen treatment on nitrifier community characteristics and micropollutant fate. Abstract 415-ENVR, 248th American Chemical Society National Meeting. San Francisco, CA, August 10 – 14, 2014. (podium presentation)

202. **Wu, C.-C.**, K. J. Martin, A. Perez De La Rosa, G. Ryskamp, N. G. Love and T. M. Olson. 2014. Effect of disinfection by-products on antibiotic resistance in the bacterial communities of point-of-use (PoU) drinking water filters. Abstract 473-ENVR, 248th American Chemical Society National Meeting. San Francisco, CA, August 10 – 14, 2014. (podium presentation)

203. **Lester, Y.**, N. G. Love, D. S. Aga, R. Singh and K. G. Linden. 2014. Demonstrating advanced oxidation/biofiltration to remove emerging contaminants from wastewater: A pilot study. Abstract 130-ENVR, 248th American Chemical Society National Meeting. San Francisco, CA, August 10 – 14, 2014. (podium presentation)

204. **Aga, D. S.**, K. G. Linden, N. G. Love, R. Singh, Y. Lester, O. S. Keen and S. Baik. 2014. Identification of degradation products of carbamazepine and iopromide after UV/H2O2 advanced oxidation and

biodegradation. 283-ENVR, 248th American Chemical Society National Meeting. San Francisco, CA, August 10 – 14, 2014. (podium presentation)

205. **Stadler, L. B.**, Smith, A. L., Jain, A. K., Martin, K. J., Delgado Vela, J., Puente, P., Cao, L., Frenette, S., Bott, C. B., Rauch-Williams, T., Shimada, T., Salveson, A., Love, N. G., Raskin, L., and Skerlos, S. J. 2014. Integrating Life Cycle Assessment and Experimental Research: Evaluating Anaerobic Membrane Bioreactors in Domestic Wastewater Treatment for Energy Recovery. Borchardt Conference. Ann Arbor, MI, February 25 – 26, 2014. (podium presentation)

206. **Stadler, L. B.**, Su, L., Aga, D. S., and Love, N. G. 2014. Understanding the impact of low dissolved oxygen treatment on nitrifier community characteristics and micropollutant fate. 4th International Conference on Occurrence, Fate, Effects, and Analysis of Emerging Contaminants in the Environment. Iowa City, IA, August 19 – 22. (podium presentation)

207. **Stadler, L. B.**, Smith, A. L., Cao, L., Love, N. G., Raskin, L., and Skerlos, S. J. 2013. Life Cycle Comparison of Emerging and Established Wastewater Energy Recovery Systems. In Mainstream Anaerobic Treatment Systems for Energy Neutral Wastewater Management Workshop at the 86th Annual Water Environment Federation Technical Exhibition and Conference (WEFTEC), Chicago, IL, October 5 – 9.

208. **Stadler, L.B.**, A.L. Smith, L. Cao, N.G. Love, L. Raskin, and S.J. Skerlos, 2013. Energy Recovery from Wastewater: Life Cycle Comparison of Carbon Removal Technologies Upstream of Autotrophic Nitrogen Removal. *WEF/IWA Nutrient Removal and Recovery 2013: Trends in Resource Recovery and Use*, July 28-31, Vancouver, British Columbia, Canada.

209. **Smith, A.L.**, T. Shimada, and L. Raskin, 2013. Syntrophic interactions in full-scale two-phase anaerobic digesters determined by pyrosequencing. *5th International Conference on Microbial Ecology and Water Engineering Conference*, July 7-10, Ann Arbor, Michigan.

210. **Stadler, L.B., A.L. Smith**, L. Cao, N.G. Love, L. Raskin, and S.J. Skerlos, 2013. Life cycle comparison of emerging and established wastewater energy recovery systems. Poster presentation. *2013 AEESP Education & Research Conference*, July 14-16, Denver, Colorado.

211. **Delgado-Vela, J.**, Stadler, L.B., and Love, N. G. 2013. Elucidating Biotransformation of Pharmaceuticals by Methanotrophic Bacteria. Association of Environmental Engineering & Science Professors 50th Anniversary Conference. Golden, CO, July 14 – 16.

212. **Moline, C. J., Stadler, L. B.**, Su, L., Ernstoff, A. S., Dapcic, A. D., Vela, J. D., Aga, D., and Love, N. G. 2012. Pharmaceutical Fate Under Varying Redox Treatment Environments. Proceedings of the 85th Annual Water Environment Federation Technical Exhibition and Conference (WEFTEC), New Orleans, LA, September 29 - October 3.

213. Smith, A. L., **Stadler, L. B.**, Cao, L., Love, N. G., Raskin, L., and Skerlos, S. J. 2012. Performance and environmental impacts of anaerobic membrane bioreactor for low-strength wastewater treatment, Proceedings of the 85th Annual Water Environment Federation Technical Exhibition and Conference (WEFTEC), New Orleans, LA, September 29-October 3.

214. **Jimenez, J.**, C. B. Bott, N. G. Love and J. Bratby. 2012. Source separation of urine as an alternative solution to nutrient management in wastewater treatment plants: a model-based analysis. Water Environment Federation Technical Exhibition and Conference. New Orleans, LA. Sept 30-Oct 3, 2012. Podium presentation.

215. **Love, N.G.** 2012. Challenges in predicting micropollutant fate in biological processes. WWTMod2012 workshop on modelling micropollutant fate in biological processes, Mont-Sainte-Anne, Québec, Canada, Feb 26-28, 2012. Podium presentation

216. **Colby, A.**, Khunjar, W., Pinto, A., Ghosh, S., Raskin, L., Love, N. Impact of Copper Stress on Nitrification Performance and the Ammonia Oxidizer Community Structure in Activated Sludge. *2011 AEESP Education & Research Conference*, Tampa, Florida, July 10-12, 2011.

217. **Smith, A.L.**, H.J. Dorer, N.G. Love, S.J. Skerlos, and L. Raskin. 2011. Psychrophilic anaerobic membrane bioreactor for domestic wastewater treatment. *2011 AEESP Education & Research Conference*, Tampa, Florida, July 10-12, 2011.

218. **Smith, A.L.**, N.G. Love, S. Skerlos, and L. Raskin, 2012. Effects of changes in temperature and hydraulic retention time on performance and environmental impacts of anaerobic membrane bioreactors for domestic wastewater treatment. *Leading-Edge Conference on Water and Wastewater Technologies*, June 3-7, Brisbane, Australia.

219. **Smith, A.L.**, Z. Li, H. Dorer, N.G. Love, S. Skerlos, and L. Raskin, 2011. Energy recovery from domestic wastewater using anaerobic membrane bioreactors. *2011 Borchardt Conference*, February 23-24, Ann Arbor, Michigan.

220. Guest, J. S., **N. G. Love**, S. Snowling, C. B. Bott, G. T. Daigger and S. J. Skerlos. Quantitative sustainable design of wastewater treatment plants. Water Environment Federation Technical Exhibition and Conference. Los Angeles, CA. October 15-19, 2011. Podium presentation.

221. **Keen, O.**, S. Baik, K. Linden, D. Aga and N. G. Love. 2011. Degradation of carbamazepine during UV/H_2O_2 treatment of wastewater. Water Environment Federation Technical Exhibition and Conference. Los Angeles, CA. October 15-19, 2011. Podium presentation.

222. **Smith, A.**, N. G. Love, S. J. Skerlos, and L. Raskin. Role of membrane biofilm in psychrophilic anaerobic membrane bioreactor for domestic wastewater treatment. Water Environment Federation Technical Exhibition and Conference. Los Angeles, CA. October 15-19, 2011. Podium presentation.

223. **Colby, A.**, Khunjar, W., Pinto, A., Ghosh, S., Raskin, L., Love, N. Impact of Copper Stress on Ammonia Oxidizer Activity and Community Structure in Nitrifying Activated Sludge. Water Environment Federation Technical Exhibition and Conference. Los Angeles, CA. October 15-19, 2011. Podium presentation.

224. **Smith, A.L.**, N.G. Love, S. Skerlos, and L. Raskin, 2011. Analysis of microbial communities in an anaerobic membrane bioreactor for domestic wastewater treatment at psychrophilic conditions. *2011 Biogas Microbiology Conference*, September 14-16, Leipzig, Germany.

225. **Colby, A.**, Khunjar, W., Pinto, A., Ghosh, S., Raskin, L., Love, N. 2011. Effect of Copper Stress on Ammonia Oxidizer Community Structure and Nitrification Performance in a Nitrifying Activated Sludge Wastewater Treatment Process. 2nd International Conference on Nitrification. Nijmegen, the Netherlands. July 1-7.

226. **Guest, J.S.**, S.J. Skerlos, N.G. Love. 2011. Quantitative sustainable design of wastewater treatment plants. *Engineering Sustainability 2011*, Pittsburgh, PA, March 10-12, 2011, Podium presentation.

227. **Cook, S. M.**, B.J. VanDuinen, S.J. Skerlos, N.G. Love. Life cycle comparison of environmental impacts from alternative pharmaceutical disposal methods. *Engineering Sustainability 2011 Conference*, Pittsburgh, PA, April 11, 2011

228. **Smith, A.L.**, N.G. Love, S.J. Skerlos, and L. Raskin. 2010. Anaerobic membrane bioreactors for sustainable domestic wastewater treatment at psychrophilic temperatures. *Proceedings of the 12th World Congress on Anaerobic Digestion*, Guadalajara, Mexico, November 1-4, 2010

229. **Smith, A.L.**, H.J. Dorer, N.G. Love, S.J. Skerlos, and L. Raskin. 2011. Role of membrane biofilm in psychrophilic anaerobic membrane bioreactor for domestic wastewater treatment. *Proceedings of the 84th Annual Water Environment Federation Technical Exhibition and Conference*, Los Angeles, California, October 15-19, 2011.

230. **Pinto, A.J.** and N.G. Love. Impact of chemical perturbation on trophic interactions and its implications for ecosystem function in an engineered environment. *13th International Symposium on Microbial Ecology 2010*, Seattle, Washington. August 22-27, 2010

231. **Love, N.G.**, W. O. Khunjar, S. Mackintosh, S. Baik, and D. Aga. The Relative Roles of Ammonia Oxidizing and Heterotrophic Activated Sludge Bacteria in Biotransforming 17α-Ethinylestradiol and Trimethoprim. Podium presentation, AEESP Special Session. 83rd Water Environment Federation Technical Exposition and Conference 2010, New Orleans, LA, October 3-6, 2010.

232. **Smith, A.L.**, N.G. Love, S. Skerlos, and L. Raskin, 2010. Anaerobic membrane bioreactors for sustainable domestic wastewater treatment at psychrophilic temperatures. *12th World Congress on Anaerobic Digestion*, October 31 - November 4, Guadalajara, Mexico. International Water Association.

233. **N. G. Love**, W. O. Khunjar, J. Skotnicka-Pitak, S. Mackintosh, S. Baik, D. S. Aga, T. Yi, and W. F. Harper Jr. 2010. Elucidating the role of ammonia oxidizing bacteria versus heterotrophic bacteria during the biotransformation of 17α-ethinylestradiol and trimethoprim. Podium presentation. International Water Association World Water Congress and Exposition, Montreal, Quebec, Canada, Sept 20-24, 2010.

234. **W.O. Khunjar**, J. Skotnicka-Pitak, S. Mackintosh, S. Baik, N. G. Love, D.S. Aga, W.F. Harper Jr. 2010. Elucidating factors that influence the biotransformation of 17 α-ethinylestradiol and trimethoprim. Poster presentation. International Water Association Leading Edge Technology Conference, Phoenix, AZ, June 1-4, 2010.

235. **Guest, J. S.**, S. J. Skerlos and N. G. Love. 2010. An optimization methodology for elucidating locality-specific sustainability trade-offs in wastewater treatment plant process selection. Poster presentation. International Water Association Leading Edge Technology Conference, Phoenix, AZ, June 1-4, 2010.

236. **Pinto, A.J.**, Hardin, S.C., Love, N.G., Fairey, A., Earle, J., Washington, P., Iler, P., Doane-Weideman, T., and Lagrange, R. Remedial Intervention Strategies for Wastewater Treatment Plant Exposed to Heavy Metal Stress: Laboratory and Pilot Scale Evaluations. Podium presentation. *Proceedings of the 82nd Water Environment Federation Technical Exposition and Conference 2009*, Orlando, Florida, October 10-14, 2009.

237. **Khunjar, W. O.**, Skotnicka-Pitak, J., Celiz, M.D., Baik, S., Love, N.G., Aga, D.S., Harper Jr., W.F. The Impact of Physiological State and Residual Organic Carbon on the Biotransformation of 17α-Ethinylestradiol and Trimethoprim by Heterotrophic Bacteria. Podium Presentation. *82nd Annual Water Environment Federation Technical Exposition and Conference*, Orlando, Florida, October 10-14, 2009.

238. **Guest, J. S.**; Cook, S. M.; Skerlos, S. J.; Love, N. G. 2009. A methodology to assess the environmental impacts of upgrading wastewater infrastructure: A case study to evaluate energy recovery from black water. Podium presentation. *Proceedings of the 82nd Annual Water Environment Federation Technical Exhibition and Conference (WEFTEC)*, Orlando, Florida, October 10-14, 2009.

239. **Thomas, W.A.**, Bott, C.B., Regmi, P., Schafran, G., Pinto, A., Love, N.G., McQuarrie, J., Rutherford, B., Baulmer, R., Waltrip, D. Evaluation of Nitrification Kinetics for a 2.0 MGD IFAS demonstration project. Podium presentation. *Proceedings of the 82nd Water Environment Federation Technical Exposition and Conference 2009*, Orlando, Florida, October 10-14, 2009.

240. **Cook, S. M.**, J. S. Guest, S. J. Skerlos, N. G. Love. 2009. Environmental characteristics of different energy recovery systems from the management of sewage sludge and food waste. Podium presentation, *IWA Sustainable Management & Technologies of Sludges Conference*, Harbin, China, August 8-11, 2009.

241. Pinto, A.J., **N. G. Love**, A. Fairey, J. Earle, P. Washington, P. Iler, T. Doane-Weideman, and R. Lagrange. 2009. Integration of online sensors with corrective action strategies to detect, monitor, and mitigate toxic shock events at nutrient removal wastewater treatment plants. *Water Environment Federation: Nutrient Removal Conference*. Washington, DC. June 28-July 1, 2009.

242. **Pinto, A.J.** and N. G. Love. Post-stress recovery of a complex ammonia oxidizing bacterial community following heavy metal cadmium stress. Short podium presentation and poster presentation. *International Conference on Nitrification 1*. Louisville, KY, July 5-9, 2009.

243. **Guest, J. S.**; Skerlos, S. J.; Daigger, G. T.; Corbett, J. R. E.; Love, N. G. 2009. The use of qualitative system dynamics to identify sustainability characteristics of decentralised wastewater management alternatives. *Proceedings of 6th IWA Leading Edge Conference on Water and Wastewater Technologies*, Singapore, June 22-25, 2009. *Invited for consideration in Water Science and Technology.*

244. **Pinto, A.J.**, S. C. Hardin, and N. G. Love. 2009. Cadmium-induced short-term structural and functional changes in ammonia oxidizing community in conventional laboratory and pilot scale activated sludge

systems. Podium presentation. *Proceedings of the ASPD5 (Activated Sludge Population Dynamics) Specialised Conference: Microbial Population Dynamics in Biological Wastewater Treatment.* International Water Association. Aalborg, Denmark, May 24-27, 2009.

245. **Gilmore, K. R.**, B. F. Smets, A. Terada, S. Lackner, J. L. Garland, N. G. Love. 2009. Microbial community analysis in an autotrophic hollow-fiber membrane-aerated biofilm reactor (HFMBR) treating a high-strength nitrogen wastewater. Podium presentation. *Proceedings of the ASPD5 (Activated Sludge Population Dynamics) Specialised Conference: Microbial Population Dynamics in Biological Wastewater Treatment.* International Water Association. Aalborg, Denmark, May 24-27, 2009, pp 146-148.

246. **Khunjar, W. O.**, Skotnicka-Pitak, J., Celiz, M.D., Mackintosh, S., Love, N.G., Aga, D.S., Harper Jr., W.F. Elucidating the Role of Ammonia Oxidizing Bacteria versus Heterotrophic Bacteria in the biotransformation of 17α-ethinylestradiol. Poster presentation. *Proceedings of the Activated Sludge Population Dynamics 5 (ASPD5): Microbial Population Dynamics in Biological Wastewater Treatment.* International Water Association. Aalborg, Denmark, May 24-27, 2009.

247. **Loh, K. J.**, J. S. Guest, G. Ho, J. P. Lynch, and N. G. Love. 2009. Layer-by-layer carbon nanotube bio-templates for in situ monitoring of the metabolic activity of nitrifying bacteria. *SPIE Smart Structures and Materials*, San Diego, CA.

248. **Ghosh, S.** and N. G. Love. MexAB-OprM efflux pump mediated changes in antibiotic susceptibilities of *Pseudomonas aeruginosa*. ASM General Meeting, Philadelphia. May 19, 2009.

249. **Love, N. G.**, D. Bronk, E. Canuel, M. Poteat, Q. Roberts, K. C. Filippino, P. Hatcher, R. Mesfioui, M. M. Mulholland, and G. Ho. The importance of effluent organic nitrogen fate and its contribution to N management in N-limited regions. Podium presentation. *Association of Environmental Engineering and Science Professors Conference*, July 26-29, 2009, Iowa City, IA.

250. **Khunjar, W. O.**, Skotnicka-Pitak, J., Celiz, M.D., Mackintosh, S., Love, N.G., Aga, D.S., Harper Jr., W.F. 2009. Elucidating the role of ammonia oxidizing bacteria versus heterotrophic bacteria in the biotransformation of 17α-ethinylestradiol. Poster Presentation. *Association of Environmental Engineering and Science Professors Conference*, July 26-29, 2009, Iowa City, IA.

251. **Pinto, A.J.**, J. S. Guest, R. Roots, N. G. Love, and S. Skerlos. 2009. A project-based active learning framework to introduce freshman engineering students to sustainable waste management and waste-to-energy technologies. Podium presentation. *Association of Environmental Engineering and Science Professors 2009 Conference*. Iowa City, IA, July 26-29, 2009.

252. **Pinto, A.J.** and N. G. Love. 2009. Structural and Functional Response of the Ammonia Oxidizing Bacterial Community to Acute Cadmium Stress in Laboratory and Pilot Scale Activated Sludge Systems. Poster presentation. *Association of Environmental Engineering and Science Professors 2009 Conference*. Iowa City, IA, July 26-29, 2009.

253. **Khunjar, W. O.**, Skotnicka-Pitak, J., Celiz, M.D., Mackintosh, S., Love, N.G., Aga, D.S., Harper Jr., W.F. 2009. Elucidating the Role of Ammonia Oxidizing Bacteria versus Heterotrophic Bacteria in the biotransformation of 17α-ethinylestradiol. Poster presentation. *Micropol and Ecohazard 2009, 6th IWA/GRA Specialized Conference on Assessment and Control of Micropollutants/Hazardous Substances in Water* June 2009, San Francisco, CA.

254. **Cook, S. M.**, J. S. Guest, M. G. Christianson, N. G. Love, S. J. Skerlos. 2009. Energy Recovery from Wastewater: Evaluation of Resource Management Alternatives for Appropriate and Environmentally Sustainable Energy Production. Podium presentation, *Engineering Sustainability 2009 Conference*, Pittsburgh, PA, April 21, 2009.

255. **H.A. Tucker**, K.F. Knowlton, and N.G. Love. 2009. Fecal and urinary estrogens in dairy heifers during the estrous cycle. *J. Dairy Sci.* **92** (Suppl. 1).

256. **Hardin, S.**, A. Pinto, N. G. Love, and A. Shaw. 2008. Impact of Contaminant-Specific Corrective Action Strategies on Wastewater Treatment Plant Performance and Recovery. Poster presentation. *Water*

Environment Federation 81st Annual Conference and Exposition, Chicago, IL, October 19-22, 2008. *1st Place - Best Poster Award.*

257. **Khunjar, W. O.**, Skotnicka-Pitak, J., Yi, T., Love, N.G., Aga, D.S., Harper Jr., W.F. 2008. Biotransformation of pharmaceutical, personal care products during nitrification – the role of nitrifiers vs. heterotrophs. Podium presentation. *ASCE World Environmental &Water Resources Congress 2008.* Honolulu, HI.

258. **Aga, D.**, N. G. Love, W. Harper, W. O. Khunjar, J. Slotnicka-Pitak, T. Yi. 2008. Biotransformation of pharmaceuticals by nitrifying and heterotrophic cultures: Investigation of degradation kinetics and metabolite identification. Keynote Address - International Water Association Leading Edge Technology Conference, Zurich, Switzerland, June 1-4, 2008.

259. **Shaw, A.**, deBarbadillo, C., Pinto, A. J., Guest, J. S., Love, N. G., Fairey, A. W., Iler, P. L., Earle, J. K., Shellenbarger, D., and Barker D. 2008. Dynamic whole plant modeling to investigate mitigation strategies for toxic shocks. *1st IWA/WEF Wastewater Treatment Modeling Seminar.* Mont-Sainte-Anne, Quebec, Canada. June-1-3, 2008.

260. **Love, N. G.** and **Skerlos, S. J.** 2008. Global Sustainable Water Systems – Acknowledging Wastewater as a Resource. *Graham Environmental Sustainability Institute Water, Health + Environment Workshop*, University of Michigan, March 26-27, 2008.

261. **Musabyimana, M.**, N. G. Love, C. B. Bott and S. Murthy. 2008. Evaluation of nitrite inhibition and toxicity in the deamonification process. Podium presentation alternate. *Proceedings of the Water Environment Federation 81st Annual Conference and Exposition*, Chicago, IL, October 19-22, 2008.

262. O'Shaughnessy, M, **M. Musabyimana**, J. Sizemore, S. Murthy, B. Wett, I. Takacs, D. Houweling, P. Sanjines, N. Love, K. Pallansch, 2008. Operations and process control of the deammonification process as a sidestream option for nutrient removal. Podium presentation. *Proceedings of the Water Environment Federation 81st Annual Conference and Exposition*, Chicago, IL, October 19-22, 2008.

263. **Khunjar, W. O.**, J. Skotnicka-Pitak, N. G. Love, D. Aga, W. F. Harper Jr. 2008. Elucidating the role of nitrifiers versus heterotrophic bacteria in the biotransformation of 17α-ethinylestradiol during wastewater treatment. Podium presentation. *Proceedings of the Water Environment Federation 81st Annual Conference and Exposition*, Chicago, IL, October 19-22, 2008.

264. **Gilmore, K. R.**, N. G. Love, B. F. Smets, A. Terada, J. Garland. 2008. Nitrifier and anammox population dynamics in an autotrophic nitrogen removal membrane biofilm reactor. Podium presentation. *Proceedings of the Water Environment Federation 81st Annual Conference and Exposition*, Chicago, IL, October 19-22, 2008.

265. **Pinto, A.**, S. Hardin and N. G. Love. 2008. Structural and functional responses of the ammonia oxidizing community in activated sludge exposed to cadmium stress. Podium presentation. *Proceedings of the Water Environment Federation 81st Annual Conference and Exposition*, Chicago, IL, October 19-22, 2008.

266. **Gilmore, K. R.**, B. F. Smets, J. L. Garland, A. Terada, and N. G. Love. 2008. Controlling gaseous nitrogen oxide emissions and nitrogen removal performance in hollow fiber membrane aerated biofilm reactors. *Proceedings of the WEF Membrane Technology 2008 Conference*, Atlanta, Georgia, January 27-30, 2008.

267. **DeBusk, J. A.**, J. Arogo Ogejo, N. G. Love, K. F. Knowlton. 2007. Adjusting nitrogen to phosphorus ratios in liquid dairy manure through nitrification and chemical phosphorus removal to match crop fertilizer requirements. Podium presentation. *Proceedings of the American Society of Agricultural and Biological Engineers (ASABE)*, Paper No. 074048, June 17-20, 2007.

268. **Guest, J. S.**, A. J. Pinto, N. G. Love and A. Shaw. 2007. Corrective action strategies for enhanced biological phosphorus removal WWTPs during short-term and prolonged toxic shock events. Podium presentation. *Proceedings of the Water Environment Federation 80th Annual Conference and Exposition*, San Diego, CA, Oct 14-17, 2007.

269. **Khunjar, W. O.**, C. Klein, T. Yi, N. G. Love, D. Aga, and W. F. Harper Jr. 2007. Cometabolism of pharmaceutical, personal care products (PPCPs) by the ammonia oxidizing bacterium Nitrosomonas europaea. Podium presentation. *Proceedings of the Water Environment Federation 80th Annual Conference and Exposition*, San Diego, CA, Oct 14-17, 2007.

270. **Ikuma, K.**, I. D. S. Henriques, B. J. Love and N. G. Love. 2007. Immobilization of *Pseudomonas aeruginosa* in alginate microbeads for use in a biosensor designed to detect oxidative toxins. Podium presentation. *Proceedings of the Water Environment Federation 80th Annual Conference and Exposition*, San Diego, CA, Oct 14-17, 2007.

271. **Gilmore, K. R.**, N. G. Love and B. F. Smets. 2007. Oxygen mass transfer in a flow-through hollow fiber membrane aeration reactor. Poster presentation. *Proceedings of the Water Environment Federation 80th Annual Conference and Exposition*, San Diego, CA, Oct 14-17, 2007.

272. **Beck, J. L.**, K. R. Gilmore, N. G. Love, K. F. Knowlton and J. Arogo Ogejo. 2007. Nitrogen removal from dairy waste using deammonification fueled by fermented dairy manure. Podium presentation. *Proceedings of the Water Environment Federation 80th Annual Conference and Exposition*, San Diego, CA, Oct 14-17, 2007.

273. **Pinto, A.J.**, Guest, J.S., Love, N.G., and Shaw, A. 2007. Elucidating the importance of contaminant specific corrective action strategies for wastewater treatment plants during toxic shocks. *Proceedings of the Water Environment Federation 80th Annual Conference and Exposition (WEFTEC)*, San Diego, CA, October 14-17, 2007.

274. **Khunjar, W. O.**, Klein, C., Skotnicka-Pitak, J., Yi, T., Love, N. G., Aga, D. Harper, W. F. Jr. 2007. Biotransformation of pharmaceuticals and personal care products (PPCPs) during nitrification: the role of ammonia oxidizing bacteria versus heterotrophic bacteria. WEF Specialty Conference - Compounds of Emerging Concern: What's on the Horizon? Providence, Rhode Island, July 29-30, 2007, Podium presentation.

275. **Fang, Y.**, Zhao, Z., Love, N. G., Knowlton, K. F., Novak, J. T. 2007. Detecting endocrine disrupting compounds in various waste matrices using a bioassay. WEF Specialty Conference - Compounds of Emerging Concern: What's on the Horizon? Providence, Rhode Island, July 29-30, 2007, Podium presentation.

276. Ikuma, K. Fraga Muller, J., Stevens, A. M., Hagedorn III, C., **Love, N. G.** 2007. Evaluating the extent of pollution-induced antibiotic resistance in environmental bacterial strains. *American Water Resources Association Summer Specialty Conference – Emerging Contaminants of Concern in the Environment: Issues, Investigations and Solutions*. Vail, Colorado, June 25-27, 2007, Podium presentation.

277. Khunjar, W. O., Klein, C., Yi, T., Henriques, I. D. S., **Love, N. G.**, Aga, D. S., Harper Jr., W. F. 2007. The relative roles of ammonia oxidizing bacteria versus heterotrophic bacteria in biotransforming 17α-ethinylestradiol under low growth rate conditions. *American Water Resources Association Summer Specialty Conference – Emerging Contaminants of Concern in the Environment: Issues, Investigations and Solutions*. Vail, Colorado, June 25-27, 2007, Podium presentation.

278. **Zhao, Z.**, K. F. Knowlton, N. G. Love and Y. Fang. 2007. Advanced treatment to reduce the estrogen content of dairy manure. *American Society of Civil Engineers World Environmental & Water Resources Congress*, Tampa Bay, FL., May 15-19, 2007. Podium presentation.

279. **Zhao, Z.**, Knowlton, K.F., Love, N. G., and Fang, Y. 2007. Dairy manure estrogens with advanced treatments. *Journal of Dairy Science*, **90**:332, Supplement 1.

280. **Pinto, A. J.**, Love, N. G. 2007. Elucidating the importance of contaminant specific corrective action strategies for wastewater treatment plants during toxic shocks. Poster presentation. *Water Environment Federation 80th Annual Conference and Exposition*, San Diego, CA, Oct 14-17, 2007.

281. **Beck, J. L.**, N. G. Love, K. F. Knowlton and J. Arogo Ogejo. 2007. Nitrogen removal from dairy waste using deammonification fueled by fermented dairy manure. Poster presentation. *Proceedings of the American Society of Agricultural and Biological Engineers (ASABE)*, June 17-20, 2007.

282. **Khunjar, W. O.**, Baik, S., Celiz, D., Yi, T., Henriques, I.D.S., Love, N. G., Aga, D. S., Harper Jr., W. F. 2007. Evaluation of the fate of environmentally relevent micropollutants. Podium presentation. *American Society of Civil Engineers World Environmental & Water Resources Congress*, Tampa Bay, FL., May 15-19, 2007.

283. **Aga, D. S.**, Harper Jr., W. F., Love, N. G. Khunjar, W. O., Klein, C., Celiz, D. M., Baik, S., Yi, T. 2007. Investigating the connection between nitrification and the removal of pharmaceuticals using engineered bioreactors. Micropol and Ecohazard 2007, Frankfurt, Germany. Podium Presentation.

284. **Pinto, A. J., Guest, J. S.**, Love, N. G., Shaw, A., Fairey, A. W., Iler, P. L., Earle, J. K., Shellenbarger, D., Barker, D. 2007. Process control at nutrient removal wastewater treatment plants during toxic shock events. State of the Art Nutrient Removal Design, Water Environment Federation and International Water Association, March 3-7, 2007, Baltimore, Maryland.

285. **Klein, C.**, Aga, D. S., Love, N. G., Khunjar, W. O., and Harper Jr., W. F. 2007. Characterizing the degradation products of 17 alpha-ethinylestradiol in activated sludge systems by LC/MS. 58th Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy. Chicago, IL, Feb 25-March 2, 2007. Podium presentation.

286. **Harper Jr. W.F.**, Love, N.G., Aga, D.S., Yi, T., Khunjar, W.O., Klein, C., O'Connor, S. Evaluating the link between nitrification and the removal of 17α-ethinylestradiol. Poster presentation. *Nutrient Removal 2007: The State of the Art. Water Environment Federation Specialty Conference*, Baltimore, MD.

287. **Ikuma, K.**, Rzigalinski, B. A. and Love, N. G. 2007. Predicting the public health impact of oxidative toxins using a bacterial glutathione-gated potassium efflux stress response biosensor. 233rd American Chemical Society National Meeting, Chicago, Illinois, March 25-29, 2007.

288. **Chandran, K.** and Love, N. G. 2006. Cd(II) mediated inhibition of *Nitrosomonas europaea* is linked to oxidative stress and is impacted by physiological state and growth mode. *Proceedings of the Water Environment Federation 79th Annual Conference and Exposition*, Dallas, TX Oct 22-25, 2006. *(Number 1 Abstract out of 120+ submissions for Research Symposium)*

289. **Kelly, R. T. Jr.** and Love, N. G. 2006. The role of glutathione mediated stress response mechanisms in nitrifying bacteria. *Proceedings of the Water Environment Federation 79th Annual Conference and Exposition*, Dallas, TX Oct 22-25, 2006.

290. **Capuno, R. E.**, Love, N. G., and Smets, B. F. 2006. Mathematical modeling of start-up scenarios for nitrogen removal via a nitritation:anaerobic ammonia oxidation-coupled biofilm in a hollow fiber membrane bioreactor. International Water Association Biofilm Systems VI, Amsterdam, The Netherlands, September 24-27, 2006.

291. **Gilmore, K. R.**, R. E. Capuno, Jr., N. G. Love, and B. F. Smets. 2006. Anaerobic stabilization of early planetary base ersatz wastewater formulation. Society of Automotive Engineers (SAE) Technical Paper Series 2006-01-2255. 36th International Conference on Environmental Systems, SAE, Norfolk, VA.

292. **Zaklikowski, A.**, Love, N. G., Vikesland, P. and Chandran, K. 2006. The effect of breakpoint chlorination practices on the activity, viability and recovery of nitrifying bacteria in chloraminated water. American Water Works Association Annual Meeting, Universities Forum. June 12, 2006.

293. **Rushing, J. C.**, Vikesland, P., Love, N. G., Mutuc, M., Chan, K. M., Casselberry, R. and Cichy, P. 2006. Evaluating in situ chemical and biological treatment approaches for two chlorinated aliphatic ethers: BCEE and BCEM. The Fifth International Conference on Remediation of Chlorinated and Recalcitrant Compounds. Battelle, May 22-25, 2006, Monterey, California.

294. **Xu, Y.**, Lei, G., Linares, K. A., Fleming, D. L., Meehan, K., Lu, G. Q., Love, N. G. and Love, B. J. 2005. Maximizing dye fluorescence via incorporation of metallic nanoparticles in solution. *SPIE (The International Society for Optical Engineering)*, **5591**:175-183.

295. **Henriques, I. D. S.**, Aga, D., Mendes, P. and Love, N. G. 2005. Metabolic footprinting: A new approach to identify changes in activated sludge physiology upon exposure to toxic compounds.

Proceedings of the Water Environment Federation 78th Annual Conference and Exposition, Washington DC, Oct 31-Nov 2, 2005, 12 pages.

296. **Muftugil, M.**, Knowlton, K. F., and Love, N. G. 2005. Using enhanced biological phosphorus removal to minimize nutrient delivery from dairy farms to receiving waters. Poster presentation at Water Environment Federation 78th Annual Conference and Exposition, Washington DC, Oct 31-Nov 2, 2005.

297. Henriques, I. D. S., Aga, D., Mendes, P. and **Love, N. G.** 2005. Metabolic footprinting: A new approach to identify changes in activated sludge physiology upon exposure to toxic compounds. *Proceedings of the 4th International Water Association Activated Sludge Population Dynamics Specialist Conference*, Gold Coast, Australia, 12 pages.

298. **Henriques, I. D. S.**, Aga, D., Mendes, P., and Love, N. G. 2005. Metabolic Footprinting: A New Approach to identify Changes in Activated Sludge Physiology upon Exposure to Toxic Compounds. Association of Environmental Engineering and Science Professors Conference, July 24-26, Clarkson University, Potsdam, New York.

299. **Fraga Muller, J.**, Craig, J., Stevens, A. M., and Love, N. G. 2005. Using Whole Genome Arrays to Investigate Functional Response to Contaminant Stress: the Response of *Pseudomonas aeruginosa* to Pentachlorophenol. Association of Environmental Engineering and Science Professors Conference, July 24-26, Clarkson University, Potsdam, New York.

300. **Fraga Muller, J.**, Craig, J., Stevens, A. M., and Love, N. G. 2005. The Stress Response of *Pseudomonas aeruginosa* to Pentachlorophenol. *Abstracts of the 105th General Meeting of the American Society for Microbiology*, Atlanta Georgia.

301. **Kelly II, R. T.** and Love, N. G. 2004. Investigating the role of oxidative stress mechanisms in chemically-inhibited nitrifiers. *Proceedings of the Water Environment Federation 77th Annual Conference and Exposition*, New Orleans, LA, October 2004, 22 pages.

302. **Kelly II, R. T.** and Love, N. G. 2004. A critical comparison of methods used to determine nitrification inhibition. *Proceedings of the Water Environment Federation 77th Annual Conference and Exposition*, New Orleans, LA, October 2004, 15 pages.

303. **Henriques, I. D. S.**, Stevens, A. M. and Love, N. G. 2004. Is biomass concentration a factor determining the sensitivity of activated sludge to toxic shocks? *Proceedings of the Water Environment Federation 77th Annual Conference and Exposition*, New Orleans, LA, October 2004, 22 pages.

304. **Linares, K.**, Fleming, D., Xu, Y., Love, N. G., Love, B. J. and Meehan, K. 2004. Evaluating strategies for integrating bacterial cells into a biosensor designed to detect electrophilic toxins. *Proceedings of the Water Environment Federation 77th Annual Conference and Exposition*, New Orleans, LA, October 2004, 17 pages.

305. **Henriques, I. D. S., Kelly II, R. T.** and Love, N. G. 2004. Deflocculation Effects Due to Chemical Perturbations in Sequencing Batch Reactors. 3rd International Symposium on Sequencing Batch Reactors, International Water Association, Brisbane, Australia.

306. **Leung, S.M.**, Little, J. C., Holst, T., and Love, N. G. 2003. Oxygen transfer and consumption in a biological aerated filter. *Proceedings of the Water Environment Federation 76th Annual Conference and Exposition*, Los Angeles, CA October 2003.

307. **Dauphinais, J. L.** and Love, N. G. 2003. Determination of toxic inhibition potential from industrial dischargers to a POTW using a respirometric assay. *Proceedings of the Water Environment Federation 76th Annual Conference and Exposition*, Los Angeles, CA October 2003.

308. **Yanosek, K.A.**, Wolfe, M. L. and Love, N. G. 2003. Assessment of enhanced biological phosphorus removal for dairy manure treatment. In the *Animal, Agricultural and Food Processing Wastes, Proceedings of the Ninth International Symposium*, 11-14 October 2003 (Raleigh, North Carolina, USA), ed. Robert Burns. ASAE Pub #701P1203. pp. 212-220.

309. **Henriques, I. D. S.** and Love, N. G. 2003. The role of floc morphology and composition on susceptibility of biomass to shock loads of chemical toxins. Poster presentation at Water Environment

Federation 76th Annual Conference and Exposition, Los Angeles, CA October 2003. *1st Place - Best Poster Award.*

310. **Holbrook, R.D.**, Novak, J. T. and Love, N. G. 2002. The role of particulate and colloidal material in the fate and transport of endocrine disrupting compounds. *Proceedings of the Water Environment Federation 75th Annual Conference and Exposition*, Chicago, IL October 2002.

311. **Leung, S.**, Holst, T., Love, N. G. and Little, J. C. 2002. A fundamental investigation of oxygen utilization in a biological aerated filter. *Proceedings of the Water Environment Federation 75th Annual Conference and Exposition*, Chicago, IL October 2002.

312. **Kelly, R. T. II, Henriques, I. D. S.**, Dauphinais, J. and Love, N. G. 2002. Evaluation of source-effect relationships for activated sludge response to shock loads of disruptive chemical toxins. *Proceedings of the Water Environment Federation 75th Annual Conference and Exposition*, Chicago, IL October 2002.

313. **Wimmer, R. F.** and Love, N. G. 2002. Activated sludge deflocculation in response to chlorine addition: the potassium connection. *Proceedings of the Water Environment Federation 75th Annual Conference and Exposition*, Chicago, IL October 2002.

314. **Love, N. G.**, Wimmer, R. F., Barker, S., Travis, J., Love, B. J., and Locascio, L. 2002. Developing sensing technologies to enable proactive operations in biological wastewater treatment. Association of Environmental Engineering and Science Professors/American Academy of Environmental Engineers Conference, August 10-14, University of Toronto, Toronto, Canada, p. 24.

315. **Love, N. G.** 2002. Invited keynote speaker. Status and Potential for Biosensors in Wastewater Treatment. European Union COST meeting, *Biosensors in Wastewater*, Milan Italy.

316. **Holbrook, R. D.**, Novak, J. T. and Love, N. G. 2001. Process considerations for the reduction of endocrine disruption potential in wastewater effluents. *Proceedings of the Water Environment Federation 74th Annual Conference and Exposition*, Atlanta, GA, October 2001.

317. **Wimmer, R. F.**, Waddell, E., Barker, S. L. R., Suggs, A., Locascio, L., Love, B. J. and Love, N. G. 2001. Development of an upset early warning device to predict deflocculation events. *Proceedings of the Water Environment Federation 74th Annual Conference and Exposition*, Atlanta, GA, October 2001.

318. **Phipps, S. D.** and Love, N. G. 2001. Quantifying observed biomass yield in a biological aerated filter. *Proceedings of the Water Environment Federation 74th Annual Conference and Exposition*, Atlanta, GA, October 2001.

319. **Love, N. G.** and Bott, C. B. 2001. Evaluating the Role of Microbial Stress Response Mechanisms in Causing Biological Treatment System Upset. Microorganisms in Activated Sludge and Biofilm Processes, Rome, Italy [see associated *Water Science and Technology* publication above].

320. **Love, N. G.**, C. B. Bott, K. C. Terlesky. 2001. Proteomic approach to assessing environmental stress in complex microbial communities." Oral presentation at the 221st American Chemical Society National Meeting, San Diego, CA. April 2, 2001.

321. **Bott, C. B.**, Abrajano, J. and Love, N. G. 2000. A physiological mechanism for activated sludge deflocculation caused by shock loads of toxic chemicals. *Proceedings of the Water Environment Federation 73rd Annual Conference and Exposition*, Anaheim, CA, October 14-18, 2000.

322. Bott, C. B., Duncan, A. J. and **Love, N. G.** 2000. Stress Protein Expression in Domestic Activated Sludge in Response to Xenobiotic Shock Loading. First World Congress of the International Water Association, Paris France [see associated *Water Science and Technology* publication above].

323. Ma, G. and **Love, N. G.** 2000. Creating Anoxic and Microaerobic Conditions in Sequencing Batch Reactors Treating Volatile BTX Compounds. 2nd International Symposium on Sequencing Batch Reactor Technologies, Narbonne, France [see associated *Water Science and Technology* publication above].

324. **Fouratt, M.**, Smithers, C., Love, N. G., and Stevens, A. M. 2000. The characterization of nitrifying bioaugmentation cultures. Poster presentation. *Abstracts of the 100th General Meeting of the American Society for Microbiology*, Los Angeles, CA. p. 491.

325. **Fouratt, M.**, Smithers, C., Love, N. G., and Stevens, A. M. 2000. The characterization of nitrifying bioaugmentation cultures. Poster presentation. *Abstracts of the 100th General Meeting of the American Society for Microbiology*, Los Angeles, CA. p. 491.

326. Delahaye, A., Gilmore, K. R., Husovitz, K. J., **Love, N. G.**, Holst, T., Novak, J. T. 1999. Distribution and characteristics of biomass in pilot-scale upflow biological aerated filters treating domestic wastewater. Podium presentation. *Proceedings of the International Association on Water Quality Conference on Biofilm Systems*, New York, NY, October 17-21.

327. **Love, N. G.**, Gilmore, K. G., Husovitz, K. J., Delahaye, A. P., Novak, J. T. and Little, J. C. 1999. Performance of a Biological Aerated Filter System Treating Domestic Wastewater for BOD, Ammonia and TSS Removal: Pilot Plant Results. Podium presentation. *Proceedings of the Water Environment Federation 72nd Annual Conference and Exposition*, New Orleans, LA, October 9-13, 1999.

328. **Husovitz, K. L.**, Gilmore, K. R., Delahaye, A. P., Love, N. G., and Little, J. C. 1999. The influence of upflow liquid velocity on nitrification in a biological aerated filter. Podium presentation. *Proceedings of the Water Environment Federation 72nd Annual Conference and Exposition*, New Orleans, LA, October 9-13, 1999.

329. **Love, N. G.**, Bott, C. B., Duncan, A. J., Terlesky, K. C. 1999. Using the molecular stress response as an indicator of system stress in complex environmental systems. Selected Podium Presentation, Association of Environmental Engineering and Science Professors Research Frontiers Conference, Pennsylvania State University, University Park, PA.

330. Bott, C. B., Terlesky, K. C., Duncan, A. Jane, Wheeler, J., and **Love, N. G.** 1998. The immunochemical detection of stress proteins as an indicator of toxic discharges to activated sludge systems. Podium presentation. *Proceedings of the Water Environment Federation 71st Annual Conference and Exposition*, Orlando, FL, October 3-7, 1998. 1:203-214.

331. Phillips, J. B., and **Love, N. G.** 1998. Biological denitrification using upflow biofiltration in recirculating aquaculture systems: pilot-scale experience and implications for full-scale. Podium presentation. *Proceedings of the Second International Conference on Successes and Failures in Commercial Recirculating Aquaculture*, Roanoke, VA. pp 171-178.

332. **Gilmore, K. R.**, K. J. Husovitz, T. Holst, and N. G. Love. 1998. Influent of organic and ammonia loading on nitrifier activity and nitrification performance for a two-stage biological aerated filter system. 1998. *Proceedings of the International Specialty Conference on Microbial Ecology of Biofilms: Concepts, Tools, and Applications*, International Association on Water Quality, Lake Bluff, Illinois, October 8-10, 1998. 309-316.

333. Terlesky, K. C. and **Love, N. G.** 1998. Detection of Hsp60 in activated sludge following exposure to xenobiotic compounds. Poster Presentation, *Abstracts of the 98th General Meeting of the American Society for Microbiology*, Atlanta, Georgia, p. 444.

334. **Terlesky, K. C.**, and Love, N. G. 1998. Photoheterotrophy in activated sludge, Poster Presentation, *Abstracts of the 98th General Meeting of the American Society for Microbiology*, Atlanta, Georgia, p. 423.

335. **Fettig, J. D.**, and Love, N. G. 1997. BTX degradation in activated sludge culture under denitrifying conditions. Podium presentation. *Proceedings from the 2nd International Conference on Microorganisms in Activated Sludge and Biofilm Processes*, International Association on Water Quality, Berkeley, CA, pp 579-582.

336. **Lubkowitz, E. M.** and Love, N. G. 1997. Development of a single sludge biological treatment scheme that incorporates nitrogen removal for a wastewater containing compounds inhibitory to nitrification. Podium presentation. *Proceedings of the Water Environment Federation 70th Annual Conference and Exposition*, Chicago, IL, October 18-22, 1997. 3(2):577-588.

337. **Rasnake, W. J.**, Love, N. G., Black, W. L., and Gruber, D. 1997. Application of a toxicity reduction evaluation at a seafood processing facility which emphasized source reduction and treatment

efficiency to minimize environmental risk. Podium presentation. *Proceedings of the 29th Annual Mid-Atlantic Industrial and Hazardous Waste Conference*, Roanoke, VA, pp 263-269.

338. **Terlesky, K. C.** and Love, N. G. 1997. Analysis of total protein present in activated sludge: applicability to monitoring the induction of indicator proteins in a microbial consortium. Poster presentation. *Abstracts of the 97th General Meeting of the American Society for Microbiology*, Miami Beach, Florida, p. 469.

339. **Novak, J. T.**, Smith, M. L., and Love, N. G. 1996. The impact of cationic salt addition on the settleability and dewaterability of an industrial activated sludge. Podium presentation. *Proceedings of the Water Environment Federation 69th Annual Conference and Exposition*, 2:211-222.

340. **Love, N. G.** and Grady, C. P. L. Jr., 1995. Impact of glucose and m-toluate on the rate and extent of benzoate-mediated TOL plasmid instability. Poster presentation. *Abstracts of the 95th General Meeting* of the *American Society for Microbiology*, Washington, D.C.

341. **Lu, Y.-T.**, Love, N. G., and Grady, C. P. L. Jr. 1993. A microscopic technique to detect plasmid-free cells in a background of plasmid-containing cells. Poster presentation. *Abstracts of the 93rd General Meeting of the American Society for Microbiology*, Atlanta, Georgia.

Published Reports (not peer reviewed)

342. Margaret R. Mulholland*, Nancy G. Love*, Deborah A. Bronk, Vikram Pattarkine, Amit Pramanik, H. David Stensel. 2009. Establishing a research agenda for assessing the bioavailability of wastewater treatment plant-derived effluent organic nitrogen in treatment systems and receiving waters. Chesapeake Bay Scientific and Technical Advisory Committee Publication 09-002, http://www.chesapeake.org/stac/Pubs/eonreport.pdf. (*co-chairs)

343. Mulholland, M. R., Love, N. G., Pattarkine, V. M., Bronk, D. A. and Canuel, E. 2007. Bioavailability of Organic Nitrogen from Treated Wastewater. Chesapeake Bay Scientific and Technical Advisory Committee Publication 07-001.

Conference Presentations (not listed elsewhere; presenter in bold, student designations as defined previously)

344. Several posters to be presented at the Association of Environmental Engineering and Science Professors Biannual Conference, Arizona State University, Tempe, Arizona. May 15-16, 2019.
    - A. Noe-Hays, A. Davis, N. J. Lowe, J. Eraci, Y. J. Ooi, A. Sabido, K. Nace, E. Rodriguez, K. Wigginton, **N. Love**. Onsite production of concentrated urine-derived fertilizer in building-scale systems using remote process monitoring and control.
    - E. Rodriguez, W. Tarpeh, K. Wigginton, **N. G. Love**. Comparative Examination of Pharmaceutical Degradation in Synthetic Urine by a Dielectric Barrier Discharge Plasma Jet and UV/H_2O_2 Reactor.
    - Kerkez, B., N. G. Love, R. L. McCaffery, M. Bartos, J. Montgomery, E. TerBeek. A First Year College Course on Smart Water Systems.

345. Several talks were given by invitation at the Rich Earth Institute's Urine Summit, August 16-17, 2017 in Brattleboro, VT. As PI, Nancy Love was involved with developing content for all these slides and overseeing their presentations.
    - Malavika Sahai. Social Research for the UM INFEWS Project.
    - Heather Goetsch. Microbial risks in source-separated urine.
    - Enrique Rodriguez. Urine-derived fertilizer tool.
    - Dylan Raye-Leonard. Pilot-scale urine diversion and processing @ UMICH

346. **Enrique Rodriguez, Dylan Raye-Leonard and Heather Goetsch**. 2017. Overview and tour of the urine-diversion and urine processing @Michigan. AEESP Biannual Conference, June 21, 2017.

347. **McFarland, A.**, Larsen, L., Love, N.G. Stormwater Management in Low-Resource Settings Using Green Infrastructure. Fall 2017. Dow Sustainability Symposium, Poster Presentation, Ann Arbor, MI.

348. **Delgado Vela, J.**, Stadler, L., Love, N.G. 2014. Elucidating Biotransformation of Pharmaceuticals by the Methanotroph *Methylosinus trichosporium* Ob3b. Gordon Research Conference Environmental Sciences: Water, Plymouth, NH, June 22-27. (poster presentation)

349. **Stadler, L. B.**, Su, L., Stevens, L., Delgado Vela, J., Aga, D. S., and Love, N. G. 2013. Impact of Redox Environment and Microbial Populations on Pharmaceutical Biotransformation. Poster presentation. IWA 5th International Conference on Microbial Ecology and Water Engineering, Ann Arbor, MI, July 7 – 10. (poster presentation)

350. **Stadler, L. B.**, Su, L., Aga, D. S., and Love, N. G. 2013. Impact of Dissolved Oxygen Concentration on Pharmaceutical Biotransformations during Wastewater Treatment. Poster presentation. Engineering Graduate Symposium, University of Michigan, Ann Arbor, MI, November 15. *(1st place in Civil & Environmental Engineering track poster competition).*

351. **Stadler, L. B.**, Su, L., Aga, D. S., and Love, N. G. 2013. Impact of Redox Environment and Microbial Populations on Pharmaceutical Biotransformation during Wastewater Treatment. Poster presentation. 86th Annual Water Environment Federation Technical Exhibition and Conference (WEFTEC), Chicago, IL, October 5 – 9.

352. **Delgado Vela, J.**, Stadler, L., Love, N.G. 2013. Elucidating Biotransformation of Pharmaceuticals by Methanotrophic Bacteria. Association of Environmental Engineering & Science Professors (AEESP) 50th Anniversary Conference, Golden CO, July 14-16.

353. **Stadler, L. B.**, Moline, C. J., Ernstoff, A. S., Su, L., Dapcic, A. D., Aga, D., and Love, N. G. 2012. Pharmaceutical Fate in Biological Treatment Reactors Across Varying Redox Environments. Poster presentation. Gordon Research Conference, Environmental Science: Water. Holderness, NH, June 25 - 29.

354. **Love, N.G.** Challenges in Predicting Micropollutant Fate in Biological Processes. WWTMod2012 Workshop on Modelling Micropollutant Fate in Biological Processes, Mont-Sainte-Anne, Québec, Canada, Feb 26-28, 2012.

355. Keen, O., Baik, S., **Stadler, L. B.**, Linden, K. G., Aga, D. S., and Love, N.G. 2011. Assessing the Use of Advanced Oxidation and Biofiltration to Remove Recalcitrant Pharmaceuticals Downstream of Biological Treatment. Borchardt Conference, University of Michigan, Ann Arbor, MI, February 23.

356. **Cook, S. M.** and N.G. Love. A Regional Strategy for Managing Food Processing and Septage Waste: The Grand Traverse Region Collaboration. Oral presentation at *Biogas Summit*. Flint, MI, October 29, 2010.

357. **Smith, A.L.**, H.J. Dorer, N.G. Love, S.J. Skerlos, and L. Raskin. Methane Production from Domestic Wastewater using Anaerobic Membrane Bioreactors. Oral presentation at *Biogas Summit*, Flint, Michigan, October 29, 2010.

358. **Cook, S. M.** and N.G. Love. A Regional Strategy for Managing Food Processing and Septage Waste: The Grand Traverse Region Collaboration. *Michigan Food Processors Summit*. Mt. Pleasant, MI, October 20, 2010

359. **S. Ghosh**, C. M. Cremers, U. Jakob, and N. G. Love. Chlorophenols modulate expression of the multidrug resistance efflux pump MexAB-OprM in *Pseudomonas aeruginosa*. Gordon Research Conference on Environmental Sciences: Water. Holderness, New Hampshire. June 20-25, 2010

360. **Guest, J.S.**, S. J. Skerlos, N. G. Love. 2011. Quantitative sustainable design of wastewater treatment plants. Borchardt 2011 Conference: A Seminar on Advancements in Water and Wastewater, Ann Arbor, MI. February 24, 2011. Podium presentation.

361. **Cook, S. M.** and N.G. Love. 2011. Two-phase anaerobic codigestion of septage and food processing waste: designing a reliable, regional waste management strategy. *Borchardt 2011 Conference*, Ann Arbor, MI, February 23-24, 2011. Poster presentation.

362. S. Ghosh, J. F. Muller, A. M. Stevens and **N. G. Love**. Chlorinated phenols and multidrug resistance in *Pseudomonas aeruginosa*. *Borchardt 2011 Conference*, Ann Arbor, Michigan. February 23-34, 2011. Poster presentation

363. **Smith, A.L.**, Z. Li, H.J. Dorer, N.G. Love, S.J. Skerlos, and L. Raskin. 2011. Energy recovery from domestic wastewater using anaerobic membrane bioreactors. Presented at *Borchardt 2011 Conference*, Ann Arbor, Michigan, February 23-24, 2011. Podium presentation.

364. **Guest, J.S.**, S.J. Skerlos, N.G. Love. 2010. An optimization methodology for elucidating locality-specific sustainability trade-offs in wastewater treatment plant process selection. *IWA Leading Edge Conference on Water and Wastewater Technologies*, Phoenix, AZ, June 2, 2010. Poster presentation.

365. **Knowlton, K. F.**, Love, N. G., Thames, T. H., and Z. Zhao. 2010. Is manure turning boy fish into girl fish? An emerging environmental challenge for livestock producers. In *Proceedings of the Virginia State Feed Association Conference*, Roanoke, VA February 19, 2010, pp 83-89.

366. **Guest, J. S.**, Love, N. G., Lamp, J., Ellis, M. W., Naha, S., and Puri, I. K. 2008. Development of a Nitrifying Microbial Fuel Cell for Sustainable Wastewater Treatment. Podium presentation. The Borchardt Conference, Ann Arbor, MI, Feb 27, 2008.

367. Khunjar, W. O., **Love, N. G.**, Skotnicka-Pitak, J., Aga, D. S., Yi, T., and Harper, W. F. Jr. 2008. Biotransformation of pharmaceuticals and personal care products during nitrification: the role of ammonia oxidizing bacteria. Podium presentation. The Borchardt Conference, Ann Arbor, MI, Feb. 27, 2008.

368. **Aruguete, D.M.**, Guest, J.S., Shrout, J. D., Love, N. G., Hochella, Jr., M. F. 2008. Bacteria quantum dot interactions and their environmental implications. Poster presentation. *Environmental Nanoparticles: Science, Ethics and Policy*, University of Delaware, Newark, DE, November 10, 2008.

369. **Skotnicka-Pitak, J.**, Aga, D. S., Khunjar, W. O., Love, N. G., Yi, T., Harper Jr., W. F. 2007. Characterization of EE2 metabolite in bioreactors with pure cultures of *Nitrosomonas europaea* and in activated sludge using LC/ITMS. *56th ASMS Conference on Mass Spectrometry.*

370. **Aruguete, D.M.**, J.S. Guest, J.D. Shrout, N.G. Love, and M.F. Hochella, Jr. 2007. Bacterial physiology and viability in the presence of quantum dot nanoparticles: towards an environmental perspective. American Geophysical Union Fall Meeting, San Francisco, California, December 10, 2007.

371. **Pinto, A.J.**, Hardin, S.C., Guest, J.S., Love, N.G., Shaw, A. 2007. Comparing toxic shock event response protocols for wastewater treatment plants. Podium Presentation. Virginia American Water Works Association and Virginia Water Environment Association Joint Annual Meeting (WaterJAM), Hampton, VA, September 16-20, 2007.

372. **Guest, J.S.**, A.J. Pinto, N.G. Love, and A. Shaw. Corrective action strategies for enhanced biological phosphorus removal wastewater treatment plants during short-term and prolonged toxic shock events. Podium Presentation. Virginia American Water Works Association and Virginia Water Environment Association Water Joint Annual Meeting 2007 (Water JAM), Hampton, Virginia, September 16-20, 2007. *Winner 2007 Best Student Paper Award.*

373. **Kelly, R. T.** and Love, N. G. 2007. Detecting nitrification problems: A comparison of methods. Podium presentation at the Pacific Northwest Clean Water Association Annual Conference, September 9-12, 2007, Vancouver, British Columbia.

374. **Guest, J. S.**, Naha, S., Frey, S., Sole, J.D., Love, N.G., Puri, I.K., Ellis, M. W. 2007. Development of a Nitrifying Microbial Fuel Cell for Sustainable Wastewater Treatment. Virginia Tech's Deans' Forum on the Environment. Blacksburg, VA. February 26, 2007, poster presentation. *First Place Student Poster – Environmental Technologies Category.*

375. **Zhao, Z.**, Knowlton, K. F., Love, N. G. 2007. Can we remove estrogens in dairy manure during storage? Virginia Tech's Deans' Forum on the Environment. Blacksburg, VA. February 26, 2007, poster presentation. *First Place Student Poster - Natural Environment Category.*

376. **Pinto, A.J.**, Guest, J.S., Love, N.G., Shaw, A. 2007. Process controls at nutrient removal wastewater treatment plants during toxic shock events. Virginia Tech's Deans' Forum on the Environment. Blacksburg, VA. February 26, 2007, poster presentation.

377. **Khunjar, W. O.**, Baik, S., Celiz, D., Yi, T., Henriques, I. D. S., Love, N. G., Aga, D. S., and Harper Jr., W. F. 2007. Evaluation of the fate of environmentally relevant micropollutants. Virginia Tech's Deans' Forum on the Environment. Blacksburg, VA. February 26, 2007, poster presentation.

378. **Gilmore, K. R.**, Love, N. G. and Smets, B. F. 2007. Nitritation and autotrophic nitrogen removal in a hollow-fiber membrane-aerated biofilm reactor. Virginia Tech's Deans' Forum on the Environment. Blacksburg, VA. February 26, 2007, poster presentation.

379. **Ikuma, K.**, Henriques, I. D. S., Rzigalinski, B. A., Love, B. J., and Love, N. G. 2007. Predicting the public health impact of oxidative toxins using a bacterial glutathione-gated potassium efflux stress response biosensor. Virginia Tech's Deans' Forum on the Environment. Blacksburg, VA. February 26, 2007, poster presentation.

380. Fraga-Muller, J., **Ikuma, K.**, Stevens, A. M., and Love, N. G. 2007. Organic contaminants cause increased antibiotic resistance in *Pseudomonas aeruginosa*. Virginia Tech's Deans' Forum on the Environment. Blacksburg, VA. February 26, 2007, poster presentation.

381. **Gungor, K.**, Arogo Ogejo, J. Knowlton, K. F., Love, N. G. 2007. Biological phosphorus removal to produce "Designer Manures" for dairy farms. Virginia Tech's Deans' Forum on the Environment. Blacksburg, VA. February 26, 2007, poster presentation.

382. **Arogo Ogejo, J.**, Gungor, K., Wen, Z., Hu, Z., Yao, T., Love, N. G., Knowlton, K. F. 2007. Recovery of phosphorus from dairy manure as struvite. Virginia Tech's Deans' Forum on the Environment. Blacksburg, VA. February 26, 2007, poster presentation.

383. **DeBusk, J.**, Arogo Ogejo, J., Love, N. G., Knowlton, K. F. 2007. Adjusting N:P ratios in liquid dairy manure through nitrification and chemical phosphorus removal to match crop fertilizer requirements. Virginia Tech's Deans' Forum on the Environment. Blacksburg, VA. February 26, 2007, poster presentation.

384. **Beck, J.**, Gilmore, K. R., Knowlton, K. F., Arogo Ogejo, J., Love, N. G. 2007. Nitrogen removal from dairy waste using deammonification fueled by fermented dairy manure. Virginia Tech's Deans' Forum on the Environment. Blacksburg, VA. February 26, 2007, poster presentation.

385. **Muller, J. F.**, Stevens, A. M. and Love, N. G. 2006. Organic contaminants cause increased antibiotic resistance in Pseudomonas aeruginosa. Poster presentation. Environmental Science – Water Gordon Research Conference, June 25-30, 2006, Holderness School, Plymouth, New Hampshire.

386. **Zhao, Z.**, Knowlton, K. F., Love, N. G., and Fang, Y. 2006. Estrogen content of treated dairy manure. Virginia Water Science and Technology Symposium, November 1-3, 2006, Blacksburg, VA. *2006 Best Student Presentation Award.*

387. **Capuno, R. E.**, Love, N. G. and Smets, B. F. 2006. Mathematical modeling of nitrogen removal via a coupled nitritation:anaerobic ammonia oxidation biofilm in a hollow fiber membrane bioreactor. Virginia Water Environment Association Annual Meeting, May 1-3, 2006, Roanoke, VA. *2006 Best Student Paper Award.*

388. **Muftugil, M.**, Knowlton, K. F., and Love, N. G. 2005. Using enhanced biological phosphorus removal to minimize nutrient delivery from dairy farms to receiving waters. Presentation at AWWA/WEA Joint Annual Meeting, Virginia Beach, Virginia, September 26-28, 2005.

389. **Khunjar, W.**, Sweetman, P., Knowlton, K. F., Smets, B. F. and Love, N. G. 2005. Treatment of anaerobically stabilized dairy waste with an oxygen limited autotrophic nitrification plus denitrification (OLAND) fixed film reactor: startup and maintenance issues. Presentation at AWWA/WEA Joint Annual Meeting, Virginia Beach, Virginia, September 26-28, 2005.

390. **Haley, M.**, Grandstaff, J. and Love, N. G. 2005. Solving a mystery: a case study using root cause analysis to decipher a toxic upset event. Presentation at AWWA/WEA Joint Annual Meeting, Virginia Beach, Virginia, September 26-28, 2005.

391. **Muftugil, M. B.**, Love, N. G. and Knowlton, K. F. 2005. Using Enhanced Biological Phosphorus Removal (EBPR) to Alter the Nitrogen:Phosphorus Ratio of Dairy Manure and to Minimize Nutrient

Delivery to Receiving Waters, Water Environment Federation Innovative Uses of Agricultural Wastes Conference, Chicago, IL, July 1-3, 2005.

392. Xu, Y., Linares, K., Meehan, K. A., Love, N. G. and Love, B. J. 2004. pH dependent optical properties of surface modified gold nanoparticles using bovine serum albumin coating. NSTI Nanotechnology Conference and Trade Show, Boston, MA, March 2004.

393. Kelly II, R. T. and **Love, N. G.** 2004. Investigating the role of oxidative stress mechanisms in chemically inhibited nitrifiers. Poster presentation. Environmental Science – Water Gordon Research Conference, June 27-July 1, 2004, Holderness School, Plymouth, New Hampshire.

394. **Sandu, S.**, Hallerman, E. and Love, N. G. 2004. Ozone treatability and pilot-scale treatment for aquaculture effluent recovery and reuse. Presented at the International Conference on Successes and Failures in Commercial Recirculating Aquaculture, Roanoke, VA, July 2004.

395. **Fleming, D.**, Linares, K., Xu, Y., Love, B., Love, N. and Meehan, K. 2004. Use of immobilized bacterial elements in an environmental biosensor. The Eighth World Conference on Biosensors, Granada, Spain. May 24-26, 2004.

396. **Chakraborty, I.**, Rhodes, R.R., Stevens, A.M., and Love, N. G. 2004. Monitoring the adaptation of an enriched bacterial consortium in response to chemical stressors using DGGE and sequencing. Poster Presentation, 10th International Symposium on Microbial Ecology, Cancun, Mexico, August 22-27, 2004.

397. **Kelly, R. T.** and Love, N. G. Mechanisms of chemical inhibition of nitrification in wastewater treatment. Virginia Water Environment Association, Roanoke, VA, May 2003. *2003 Best Student Paper Award.*

398. **Leung, S.M.**, Little, J. C., Holst, T., and Love, N. G. 2003. Oxygen transfer and consumption in a biological aerated filter. Virginia Water Environment Association, Roanoke, VA, May 2003.

399. **Dauphinais, J. L.** and Love, N. G. 2003. Determination of toxic inhibition potential from industrial dischargers to a POTW using a respirometric assay. Virginia Water Environment Association, Roanoke, VA, May 2003.

400. **Bott, C.B.**, Henriques, I. D. S., Kelly, R. T., Dauphinais, J. L., and Love, N. G. 2002. WERF - Upset early warning systems for biological wastewater treatment. *Proceedings of the Water Environment Federation 8th Annual Industrial Wastes Technical and Regulatory Conference*, Atlantic City, New Jersey, August 11-14, 2002.

401. **Holbrook, R.D.**, Novak, J. T. and Love, N. G. 2002. The role of particulate and colloidal material in the fate and transport of endocrine disrupting compounds. Joint Annual Meeting of the Virginia Water Environment Association and Virginia American Water Works Association, September 2002, Virginia Beach, VA.

402. **Leung, S.**, Holst, T., Love, N. G. and Little, J. C. 2002. A fundamental investigation of oxygen utilization in a biological aerated filter. Joint Annual Meeting of the Virginia Water Environment Association and Virginia American Water Works Association, September 2002, Virginia Beach, VA.

403. **Kelly, R. T. II**, **Henriques, I. D. S.**, Dauphinais, J. and Love, N. G. 2002. Evaluation of source-effect relationships for activated sludge response to shock loads of disruptive chemical toxins. Joint Annual Meeting of the Virginia Water Environment Association and Virginia American Water Works Association, September 2002, Virginia Beach, VA.

404. **Wimmer, R. F.** and Love, N. G. 2002. Activated sludge deflocculation in response to chlorine addition: the potassium connection. Joint Annual Meeting of the Virginia Water Environment Association and Virginia American Water Works Association, September 2002, Virginia Beach, VA.

405. **Love, N. G.** and Bott, C. B. 2002. In search of physiological mechanisms linked to wastewater treatment malfunctions caused by toxic chemicals. Oral presentation. Gordon Research Conference on Microbial Stress Responses. July 14-19, Salve Regina University, Newport, Rhode Island.

406. **Brazil, B. L.** and Love, N. G. 2002. Design and implementation of a pilot-scale nitrogen removal system employing fermentation of endogenous carbon sources to treat an aquaculture waste stream. Aquaculture America 2002, Jan. 27-30, San Diego, CA.

407. **Wimmer, R. F.** and Love, N. G. 2001. Potassium efflux as a bacterial defense mechanism against chlorinated disinfectants. Virginia Water Environment Association Annual Meeting, May 2001. Williamsburg, VA. *2001 Best Student Research Paper Award.*

408. **Brazil, B. L.** and Love, N. G. 2001. Design and implementation of a pilot-scale nitrogen removal system employing fermentation and endogenous carbon sources to treat an aquaculture waste stream. Virginia Water Environment Association Annual Meeting, May 2001. Williamsburg, VA.

409. **Bott, C. B.** and Love, N. G. 2000. Mechanistic evaluation of activated sludge deflocculation in response to shock loads of electrophilic xenobiotic chemicals. Virginia Water Environment Association Annual Meeting, May 2000, Roanoke, VA. *2000 Best Student Research Paper Award.*

410. **Ma, G.** and Love, N. G. 1999. BTX biodegradation under anoxic, microaerobic, and aerobic conditions in activated sludge sequencing batch reactors. Podium presentation. Virginia Water Environment Association Annual Meeting, May 1999, Tyson's Corner, VA. *1999 Best Student Research Paper Award.*

411. **Love, N.G.**, Delahaye, A., Gilmore, K. R., Holst, T., Husovitz, K. J., Little, J. C., and Novak, J. T. 1999. Performance of a two-stage biological aerated filter system treating domestic wastewater for BOD and ammonia removal – pilot-scale results. Podium presentation. Virginia Water Environment Association Annual Meeting, May 1999, Tyson's Corner, VA.

412. **Love, N. G.** 1999. The Applicability of the Microbial Stress Response as an Indicator for In Situ and Up-Stream Wastewater Treatment Monitoring. Invited podium presentation. Virginia Water Environment Association Industrial Waste and Pretreatment Seminar, Charlottesville, VA.

413. **Ma, G., Bilyk, K.** and Love, N. G. 1999 Nitrite accumulation and inhibition during denitrification. Poster presentation. Virginia Water Environment Association Industrial Waste and Pretreatment Seminar, Charlottesville, VA. *2nd Place Best Student Research Award.*

414. **Phipps, S.**, Love, N. G., and Novak, J. T. 1999 Dewatering of oily wastewater sludge. Poster presentation. Virginia Water Environment Association Industrial Waste and Pretreatment Seminar, Charlottesville, VA. *3rd Place Best Student Research Award.*

415. **Love, N .G.**, Duncan, A. J., and Bott, C. B. 1998. Detection of Hsp60 in activated sludge following heat shock and exposure to xenobiotic compounds. Poster presentation. Gordon Research Conference on the Microbial Stress Response, New England College, Henniker, NH.

416. **McInnis, J.**, Love, N. G., and Novak, J. T. 1998. Pilot Study of Aerobic Treatment of Waste Oily Sludge. Podium presentation. Virginia Water Environment Association Annual Meeting, Norfolk, Virginia.

417. **Fallon, A.**, Novak, J. T., and Love, N. G. 1998. Biological Treatment of Oily Sludge: Laboratory Studies. Podium presentation. Virginia Water Environment Association Annual Meeting, Norfolk, Virginia. *1998 Best Student Research Paper Award.*

418. **Phillips, J.**, and Love, N. G. 1997. Denitrification of recirculating aquaculture system waters using an upflow fixed film bioreactor. Podium presentation. Virginia Water Environment Association Annual Meeting, Roanoke, Virginia. *1997 Best Student Research Paper Award.*

419. **Perri, K. L.**, and Love, N. G. 1997. The effectiveness of sequential treatment strategies on the treatability of a high strength industrial wastewater. Podium presentation. Virginia Water Environment Association Annual Meeting, Roanoke, Virginia.

420. **Love, N. G.** and Grady, C. P. L. Jr. 1994. The impact of second substrates on the expression of a TOL plasmid. Poster presentation. Gordon Research Conference on Environmental Sciences: Water, New Hampton, New Hampshire.

421. **Hegan (Love), N. G.** and Pfeffer, J. T. 1987. Using oxidation-reduction potential as a monitoring device for biological phosphorus removal systems. Podium presentation. Texas Water Pollution Control Association Annual Meeting, Corpus Christi, Texas.

FUNDED PROJECTS

(Total Value: $29.3 million; Share Value: $7.4 million)

Research Support Received – External Programs

(Total Value: $21.6 million; Share Value: $5.8 million)

1.	Love, N. G. An effect-directed monitoring program for SWIFT effluent-Yr 2. Hampton Roads Sanitation District	$130,000 3/1/17-continuing 100% share
2.	Love, N. G., J. P. Newell, M. Arabi, T. Bradley and S. P. McElmurry. Planning Grant: Engineering Research Center for Regenerative, Restorative and Resilient Community Infrastructure Systems (R3CIS). National Science Foundation.	$100,000 09/18 – 08/20 100% share
3.	McElmurry, S. P., M. Seeger, N. G. Love, B. Kerkez, J. A. MacDonald Gibson. COLLABORATIVE PROPOSAL: CRISP 2.0 Type 2 – Water and Health Infrastructure Resilience and Learning (WHIRL). National Science Foundation.	$2 million 09/18 – 08/22 5% share
4.	Love, N. G., V. Bertacco, B. Kerkez, L. Larsen. IRES: Advancing Cyber-Enabled, Decentralized Water Systems in Rapidly Developing Cities. National Science Foundation.	$249,989 09/17 – 08/20 25% share
5.	Lastoskie, C. and N. G. Love. Workshop: Advancing Healthy Communities – the 2017 AEESP Meeting. National Science Foundation.	$49,999 01/17 – 12/17 50% share
6.	Kerkez, B. and N. G. Love. Dynamic collection system reconfiguration through real-time modeling and control. Great Lakes Water Authority	$131,864 5/22/17-11/21/18 10% share
7.	Daigger, G. T. and N. G. Love. Characterizing the performance and operational characteristics of the bioreactors at the Detroit, MI wastewater treatment plant. Great Lakes Water Authority.	$100,000 5/1/17-4/30/17 10% share
8.	Daigger, G. T. and N. G. Love. Traverse City regional wastewater treatment plant's comma-shaped Gram positive bacteria study. Traverse City Regional Wastewater Treatment Plant.	$120,000 9/1/16-12/31/17 25% share
9.	Love, N.G., D. S. Aga, R. Hardin, A. Noe-Hays, and K. R. Wigginton. INFEWS/T3: Advancing technologies and improving communication of urine-derived fertilizers for food production within a risk-based framework. National Science Foundation.	$3 million 9/1/16-8/31/20 23% share
10.	McElmurry, S. (PI, Wayne State University), multiple co-PIs, N. G. Love is co-PI for project and PI for UM. Flint Area Community Health and Environment Partnership (FACHEP) Phase II Study-Enhanced disease surveillance and environmental monitoring in Flint, Michigan. State of Michigan Department of Health and Human Services.	$2 million 8/1/16-12/31/17 ~4% share
11.	Xu, M., J. Johnson, N. G. Love, S. Miller and J. Newell. UNS: U.S.-China: Integrated systems modeling of food-energy-water (FEW) nexus for urban sustainability. National Science Foundation.	$499,990 61/16-5/31/20 10% share
12.	Love, N.G. and T. M. Olson. RAPID: Assessing microbiological quality across point-of-use filters deployed in Flint, MI. ($30,250 cost share from College of Engineering). National Science Foundation.	$49,999 4/1/16 – 3/31/2017 50% share
13.	Newell, J. P., G. T. Daigger, N. McClintock, A. Ramswami,J. Vandermeer. N.G. Love Senior Personnel and one of three proposal authors (with Newell and	$69,242 7/01/15 – 12/31/15

	Daigger). FEW Workshop: "Scaling Up" Urban Agriculture to Mitigate Food-Energy-Water Impacts. National Science Foundation.	30% share
14.	Love, N.G. and C. B. Bott. GOALI: Developing Sensor-Mediated Control Strategies that Allow Innovative Treatment of Nitrogen in Wastewater. National Science Foundation.	$330,000 9/1/14 – 8/31/18 100% share
15.	Wigginton, K. R., N. G. Love, J. Jimenez, A. Noe Hayes, D. S. Aga, C. B. Bott. Nutrient Recovery Through Urine Separation. Water Environment Research Foundation EPA Water Center.	$554,034 5/1/14 – 12/31/15 10% share
16.	Raskin, L. and N. G. Love. Evaluation of Waste Activated Sludge Anaerobic Contactor (WASAC™) as a Process for Energy Conservation at Domestic Wastewater Treatment Plants. Carollo Engineering.	$104,481 3/1/2013-4/30/2014 50% share
17.	Love, N.G., L. Raskin, C. Bott, S. Skerlos and A. Salveson. Low Energy Alternatives for Activated Sludge-Advancing Anaerobic Membrane Bioreactor Technology. Water Environment Research Foundation.	$527,000 1/1/2013-12/31/2014 33% share
18.	Burns, M. A. and N. G. Love. Point-of-Use Water Quality Assessment (Sensors for Faucets). MASCO Inc.	$583,868 9/1/12-8/31/15 10% share
19.	Linden, K., D. S. Aga and N. G. Love. Demonstrating Advanced Oxidation/ Biofiltration for Pharmaceutical Removal in Wastewater. Water Environment Research Foundation.	$150,000 3/1/2012-8/31/2013 10% share
20.	Raskin, L., S. J. Skerlos and N. G. Love. Low-temperature Anaerobic Membrane Bioreactors for Sustainable Domestic Wastewater Treatment. National Science Foundation (CBET-1133793)	$404,365 9/1/11 – 8/31/14 10% share
21.	Olson, T. and N. G. Love. Point-of-Use Devices as Incubators of Halogenated Phenol-Mediated Antibiotic Resistant Bacteria. National Science Foundation (CBET-1067450) (includes $55,669 supplement to support dissertation work of Mr. Bayable Atnafu Kassa of Addis Ababa University)	$373,556 5/1/11 – 4/30/15 50% share
22.	Love, N. G., J. S. Guest and S. J. Skerlos. Quantitative Sustainable Design of Chesapeake-Elizabeth WWTP Upgrade Alternatives	$8,500 1/1/11-6/30/11 33% share
23.	Love, N. G. Understanding Microaerobic Metabolism in a Sustainable World. Water Environment Research Foundation	$149,312 2/1/10–3/31/12 100% share
24.	Savage, P. E., G. Keoleian, A. Matzger, S. Linic, and N. Lin (Senior Personnel = H. Wang and N. G. Love). EFRI HyBi: The Science and Engineering of Microalgae Hydrothermal Processing. National Science Foundation (EFRI 0937992)	$2,000,000 9/1/09-8/31/13 2% share
25.	Love, N. G., K. Linden and D. S. Aga. Demonstrating Advanced Oxidation Technologies on Pharmaceutical Removal Downstream of Biological Treatment. Water Environment Research Foundation.	$80,000 1/1/10-5/15/11 34% share
26.	Love, N. G. and L. Raskin. MSB – Investigating the Relationship Between Structural Diversity and Functional Resilience to Stress in Ammonia Oxidizers. National Science Foundation (IOS-0919629)	$312,560 9/1/09-8/31/11 50% share
27.	Raskin, L., S. J. Skerlos and N. G. Love. Anaerobic Membrane Bioreactors for Sustainable Wastewater Treatment. Water Environment Research Foundation	$159,938 5/1/09-4/30/11 10% share

28.	Bott, C. B., Schafran, G., Mulholland, M. and Love, N. G. Integrated Fixed-Film Activated Sludge (IFAS) Demonstration Project at the James River Wastewater Treatment Plant (JRWWTP). Hampton Roads Sanitation District	$100,000 4/1/08–3/31/09 30% share
29.	Bronk, D., Canuel, E., Hatcher, P., Love, N. G. and Mulholland, M. Collaborative Research: Assessing the Bioavailability of Effluent Organic Nitrogen Along a Freshwater to Saltwater Continuum. National Science Foundation (NG Love original PI, shifted to co-PI upon moving to MI)	$448,073 4/1/08–3/31/10 8% share
30.	Love, N. G., Ellis, M., Puri, I. Development of a Nitrifying Microbial Fuel Cell for Sustainable Wastewater Treatment. Water Environment Research Foundation	$155,869 3/15/07–3/14/09 50% share
31.	Edwards, M. and Love, N. G. Effects of Nitrification on Distribution System Materials. American Water Works Research Foundation	$350,000 1/15/07–11/15/09 8% share
32.	Love, N. G. Anammox Studies in Association with DC Water and Sewer Authority. District of Columbia Water and Sewer Authority	$95,000 9/1/06–8/31/08 100% share
33.	Love, N. G. Development of Response Protocols for Wastewater Treatment Plants Exposed to CBR Contaminants. Water Environment Research Foundation.	$300,000 1/1/06–8/31/08 100% share
34.	Love, N. G. Preliminary Nitritation Experiments in Support of the Reject Water Treatment Study for The Blue Plains Advanced Wastewater Treatment Facility. District of Columbia Water and Sewage Authority.	$32,133 12/24/05–6/24/06 100% share
35.	Love, N. G. Planning, Mobilization, Enrichment and Evaluation of Anammox Organisms. District of Columbia Water and Sewage Authority.	$7,364 11/15/05–9/30/06 100% share
36.	Love, N. G. and Love, B. J. Detection of Toxins in the Water Supply. National Institute of Standards and Technology.	$75,000 10/1/05–9/29/06 50% share
37.	Love, N. G., Aga, D. S. and Harper, W. J. Collaborative Research: The Biotransformation of Hydrophobic and Hydrophilic Pharmaceuticals and their Metabolites by Nitrifying and Heterotrophic Cultures, National Science Foundation.	$414,196 6/1/2005–5/31/2009 26% share
38.	Bonner, J. S., Love, N. G., Jones, K. L., Zaslavsky, I., Baru, C. K., Fountain, T., Wentling, T. L., Collaborative Large-Scale Engineering Analysis Network for Environmental Research for the Coastal Margin, National Science Foundation.	$85,309 8/1/2004–7/31/2005 8% share
39.	Love, N. G., Knowlton, K. F. and Smets, B. F. Wastewater Treatment to Minimize Nitrogen Delivery from Dairy Farms to Receiving Waters. The Cooperative Institute for Coastal and Estuarine Environmental Toxicology.	$214,200 9/1/2004–8/31/2006 60% share
40.	Love, N. G. and Smets, B. F. Integrated Biotreatment Technology for Nitrogen-Rich Wastewaters in Advanced Life Support Systems. NASA.	$419,119 10/1/2004–9/30/2007 90% share
41.	Shaw, A. and Love, N. G. Feasibility Testing of Support Systems to Prevent Upsets. Water Environment Research Foundation.	$175,000 3/1/04–2/28/06 15% share
42.	Vikesland, P. and Love, N. G. Treatability Evaluation of Three Chlorinated Organic Compounds. Parsons Corporation.	$115,730 12/19/03–12/31/04 50% share

43.	Vikesland, P. and Love, N. G. Effects of Dissimilatory Iron Reducing Bacteria on the Longevity of Iron Permeable Reactive Barriers. Virginia Water Resources Research Center.	$18,500 7/1/03–6/30/04 20% share
44.	Knowlton, K. F., Love, N. G. and Mullins, G. Wastewater Treatment to Minimize Nutrient Delivery from Dairy Farms to Receiving Waters. The Cooperative Institute for Coastal and Estuarine Environmental Toxicology.	$278,934 9/1/03–8/31/05 40% share
45.	Love, N. G., Meehan, K. A., Love, B. J. A Microfluidic Biosensor for Environmental Monitoring. U. S. Environmental Protection Agency Midwest Hazardous Substances Research Center.	$279,022 10/1/03–9/30/06 34% share
46.	Love, N. G. Factors Affecting the Performance of Acid Phase Digesters Treating Municipal Sludges: Stage I. District of Columbia Water and Sewer Authority.	$24,382 6/3/02–11/30/02 100% share
47.	Vikesland, P., Love, N. G. and DiGiano, F. Assessment of Seasonal Practices and Impacts to Chloraminating Utilities. American Waterworks Association Research Foundation.	$528,362 7/1/02–1/1/05 22% share
48.	Little, J. D. and Love, N. G. Optimizing a Biological Aerated Filter. Virginia Center for Innovative Technology.	$30,000 3/1/02–10/31/02 50% share
49.	Little, J. C., Filz, G., Berry, D., Eick, M., Hochella, M., Love, N., Schreiber, M., Widdowson, M. GAANN: An Interdisciplinary Program in Environmental Biogeochemistry. US Dept of Education.	Phase I: $432,855 8/16/01–8/15/04 17% share Phase II: $373,599 8/16/04–8/15/07 8% share
50.	Novak, J. T., Holbrook, D., Love, N. G. Endocrine Disrupting Potential in Wastewater Effluents and Biosolids. Virginia Water Resources Research Center.	$19,200 7/1/01–6/30/02 33% share
51.	Love, N. G. and Little, J. C. Development of a Fundamentally-Based Model of a Biological Aerated Filter. Degremont North American Research and Development, Inc.	$55,420 6/11/01–8/10/02 50% share
52.	Novak, J. T., Holbrook, D., Love, N. G. Endocrine Disrupting Potential in Wastewater Effluents and Biosolids. Virginia Water Resources Research Center.	$19,200 7/1/01–6/30/02 33% share
53.	Bishop, P., Love, N. G., and Stevens, A. M. Adaptation of subsurface microbial biofilm communities in response to chemical stressors. EPA Hazardous Substance Research Center (Purdue University).	$214,000 9/1/01–8/31/03 50% share
54.	Love, N. G., Upset early warning systems for biological treatment processes: fundamental studies on source-cause-effect relationships, Water Environment Research Foundation.	$326,646 1/1/01–4/30/04 100% share
55.	Novak, J. T., Love, N. G., and Hughes, J. M. Testing of a Package Wastewater Treatment System and Consultation Services for UTD, Inc., UTD, Inc. STTR II.	$150,100 10/1/00–5/1/02 45% share
56.	Love, N. G. and Love, B. J. New technologies: integrating microfluidics, materials science and microbiology: biosensors for protecting wastewater treatment systems. National Science Foundation.	$105,050 9/1/00–12/31/02 75% share
57.	Love, N. G., Grizzard, T., and Novak, J. T. Virginia Tech's Plan of Study for the Loudoun County Sanitation Authority Broad Run Advanced Wastewater Treatment Pilot Plant Study. CH2M Hill, Inc.	$126,564 8/15/00–5/31/01 30% share

58.	Love, N. G. Monitoring the full-scale Biofor® biological aerated filter system at Roanoke, VA. Infilco Degremont, Inc.	$30,000 12/24/99–2/15/01 100% share
59.	Love, N. G. and Bott, C. B. Assessment and framing workshop on upset early warning systems. Water Environment Research Foundation.	$81,064 6/30/99–7/1/00 75% share
60.	Love, N. G. and Stevens, A. M. Characterizing nitrifying bioaugmentation cultures. Sybron Chemical Company and Virginia Center for Innovative Technology.	$90,000 9/1/98–6/30/00 50% share
61.	Love, N. G. Evaluating protein induction patterns in industrial activated sludge cultures. Eastman Chemical Company.	$43,294 12/1/97–12/31/98 100% share
62.	Love, N. G., Little, J. C., and Novak, J. T. A Fundamentally-based investigation into the operational potential of the Biofor® biological aerated filter. Degremont North American Research and Development, Inc., with matching from the Virginia Center for Innovative Technology.	$95,592 9/97–12/98 50% share
63.	Widdowson, M. A. Love, N. G., and Novak, J. T. Evaluation of intrinsic bioremediation at the Douge Creek Subdivision, Ft. Belvoir, VA. Horne Engineering Services, Inc.	$28,800 9/16/96–9/16/97 10% share
64.	Love, N. G., Widdowson, M. A, and Novak, J. T. An investigation into the use of biologically-based treatment technologies for waste oil volume reduction at Norfolk Southern Corporation. Norfolk Southern Corporation and Virginia Water Resources Research Center.	$116,835 8/1/96–8/31/98 45% share
65.	Love, N. G. Laboratory studies to assess wastewater treatment strategies for Eastman Chemical Company. Eastman Chemical Company.	$10,000 11/15/95–3/1/97 100% share
66.	Love, N. G. The distribution and expression of BTX-degrading microorganisms in anoxic/aerobic single sludge biological treatment processes. National Science Foundation CAREER Award.	$335,618 7/1/95–6/30/99 100% share
67.	Love, N. G. The role of anoxic zones in preventing methylethyl ketoxime inhibition of nitrification. Virginia Water Resources Research Center and AlliedSignal Chemical Company.	$20,000 4/1/95-4/30/96 100% share
68.	Love, N. G. and Novak, J. T. The impact of industrial wastewater composition on the bioflocculation of biological sludges. Virginia Water Resources Research Center and Eastman Chemical Company.	$30,000 2/1/95–2/29/96 50% share

Research Support Received – Internal Programs
(Total Value: $4.0 million Share Value: $424,850)

69.	Love, N. G., M. Zimmerman. Partnerships that Support Confident Use and Management of Point-of-Use Drinking Water Units in Flint, MI. University of Michigan Poverty Solutions Center.	$25,000 Jan 2020-present 90% share
70.	Love, N.G., J. Eisenberg, A. Jones. Addressing the Food-WASH Nexus Across the Urban-Rural Gradient and Impacts on Childhood Stunting. University of Michigan MCubed 2.0 Program.	$60,000 2015-2017 33% share
71.	Schwank, J., M. Bareau, G. Fisher, P. Adriaens, E. Hill, N. G. Love, R. Clarke, J. Diana, K. Wigginton, D. Scavia, A. Hoffman, S. Miller, A. Huang-Saad, J. Trumpey, L. Raskin, S. Skerlos, A. Todd. REFRESCH: Researching Fresh	$2,998,832 7/1/14 – 6/30/17 1 of 17 co-PIs at 6% share each

	Solutions to the Energy/Water/Food Challenge in Resource-Constrained Environments. University of Michigan Third Century Initiative.	
72.	Newell, J., N. G. Love and R. Norton. Planning for Technological Innovation: Water, Infrastructure and Sustainability. University of Michigan MCubed program.	$60,000 1/13/13 – 12/31/14 33% share
73.	Kolars, J. D., N. G. Love, S. Fisseha, A. Burton, L. Isom, P. Yadav, J. Godfrey, and K. Sienko. A Proposal to Develop the Ethiopia-Michigan Platform for Advancing Collaborative Engagement (EM-PACE). University of Michigan Third Century Initiative. N. Love co-leads the Environmental Initiative within this program.	$297,800 1/1/14 – 8/31/15 1 of 8 co-PIs at 12% each
74.	Love, N. G., Skerlos, S., and Raskin, L. Global Sustainable Water Systems – Acknowledging Wastewater as a Resource. Graham Environmental Sustainability Institute, University of Michigan.	$5,000 1/1/08–8/1/08 34% share
75.	Love, N.G., Muller, J. F., Stevens, A. M. and Hagedorn, C. Evaluating the extent of pollution-induced antibiotic resistance in environmental bacterial strains. Virginia Water Resources Research Center.	$18,000 7/1/06–6/30/07 25% share
76.	Vikesland, P., Love, N. G. and Knocke, W. R. Construction of the Environmental BioNanoTechnology Laboratory (EB/NL), ASPIRES.	$82,030 7/1/05–6/30/06 33% share
77.	Knowlton, K. F., Love. N. G., and Ogejo, J. A. Fate of endocrine disrupting compounds in dairy manure during storage and treatment. Virginia Water Resources Research Center.	$18,000 7/1/05–6/30/06 33% share
78.	Hallerman, E. and Love, N. G. Scale up of water treatment and recovery system at Blue Ridge Aquaculture. Virginia Tech Commercial Fisheries and Shellfish Technologies Program	$26,569 7/1/01–6/30/02 50% share
79.	Love, N. G., Dietrich, A., Edwards, M., Godrej, A., Grizzard, T., Novak, J. T., Schreiber, M. Acquisition of a gas chromatograph with both mass spectrometer and flame photometric detector in support of water quality research. Virginia Tech ASPIRES program.	$88,340 1/1/01–12/31/01 14% share
80.	Gibson, H. W., Bevan, D. R., Love, N. G. A collaborative effort to establish a research program for developing biomimetic sensors using molecularly imprinted polymers (MIPs). Virginia Tech ASPIRES program.	$50,393 1/1/01–12/31/01 33% share
81.	Widdowson, M., Schreiber, M., and Love, N. G. Evaluating processes that control natural attenuation of nitrate in natural waters. Virginia Water Resources Research Center.	$5,000 7/1/00–6/30/01 33% share
82.	Love, N. G. and Knowlton, K. F. Development of a collaborative effort on environmentally responsible management of dairy wastes. Virginia Tech ASPIRES program plus College and Departmental matching support.	$37,944 1/1/00–5/31/01 50% share
83.	Stevens, A. M. and Love, N. G. Development of a *lux* reporter for the anaerobic human pathogen *Bacteroides*. Virginia Tech Optical Sciences and Engineering Research Center.	$50,000 7/1/00–6/30/01 10% share
84.	Love, N. G. and Brazil, B. L. Performance optimization and economic analysis of a fluidized denitrifying unit for treating aquaculture effluents. Virginia Tech Commercial Fisheries and Shellfish Technologies Program.	$57,456 7/1/99–6/30/01 50% share
85.	Popham, D. L., Brewer, K. J., Esen, A., Love, N. G., Rutherford, C. L., Shirley, S. W., Stevens, A. M., and Walker, R. A. Establishment of a phosphor/fluorescent imaging facility in Derring Hall. Virginia Tech ASPIRES program.	$69,200 1/98–12/99 2% share

86.	Love, N. G. and Stevens, A. M. Development of a collaborative research effort in environmental biotechnology as applied to biological wastewater treatment systems. Virginia Tech ASPIRES program.	$32,080 1/98–12/99 50% share
87.	Widdowson, M. A., Love, N. G., Novak, J. T., and Berry, D. F. Intrinsic bioremediation of contaminants in groundwater and soil: A strategy for research and partnerships. Virginia Tech ASPIRES program.	$37,300 4/97–3/98 25% share
88.	Love, N. G. Denitrification of recirculating aquaculture system waters. Virginia Tech Commercial Fisheries and Shellfish Technologies Program.	$6,000 3/1/95–6/30/96 100% share
89.	Randall, C. W. and Love, N. G. Identification of bacterial groups in biological nutrient removal systems. Virginia CORE Research Program.	$4,300 7/1/94–6/30/95 50% share

Institutional/ Educational Support Received – External Programs
(Total Value: $3.7 million, Share Value: $1.2 million)

90.	Love, N. G., Thole, K. A. and McCrickard, S. Development and Maintenance of a Portal Website for the NSF Advance Program, National Science Foundation.	$94,671 9/1/04-8/31/06 12% share
91.	Layne, P., Love, N. G. and Thole, K. A. ADVANCE Engineering Workshop, National Science Foundation.	$61,381 8/1/04–1/31/05 33% share
92.	McNamee, M., Hyer, P.B, Love, N. G. and Thole, K. A. ADVANCE Institutional Transformation Award for Virginia Tech. NSF. Co-initiated and co-authored proposal. Active participant from 2003-2006.	$3,460,211 7/1/03–6/30/08 33% share
93.	Oerther, D. and Love, N. G. Workshop to Explore the Value of Applying Molecular Biology Tools in Environmental Engineering, National Science Foundation.	$21,400 10/1/01–9/30/02 10% share
94.	Love, N. G. Making the Connection Program, Women in Engineering Programs and Advocates Network.	$5,000 12/1/1999–1/31/2003 100% share
95.	Little, J. C. and Love, N. G. Environmental Engineering: Creation of an electronic textbook. SUCCEED and College of Engineering Green Engineering Program.	$30,416 1/1/95–5/31/97 50% share

INVITED SEMINARS AND PRESENTATIONS

1. Invited Speaker – My Career Path: Seminar for CWEA-AWWA Student Chapter, California State Polytechnic University, Pomona. November 19, 2020.
2. Invited Speaker - Water Infrastructure in Resource-Constrained Shrinking and Expanding Cities: The Impact on Water Quality and Public Health. University of Arizona Department of Chemical and Environmental Engineering. September 21, 2020.
3. Invited Speaker: Rethinking America's Urban Water Infrastructure: Resource Efficiency, Access, and Public Health. University of Notre Dame, Civil and Environmental Engineering Challenges and Innovation Seminar Series. Virtual. September 17, 2020.
4. Invited Speaker. Water Infrastructure in Resource-Constrained Shrinking and Expanding Cities: The Impact on Water Quality and Public Health. Department of Environmental Engineering, Technical University of Denmark. January 17, 2020.
5. American Academy of Environmental Engineers and Scientists Kappe Lecturer

(https://www.aaees.org/kappelectureseries/kappelecturer.php). 2019-2020. Offered two talks and presented both at most venues. Talk 1: "Rethinking America's Urban Water Infrastructure: Resource Efficiency, Access and Public Health" or Talk 2: "Environmental Engineering and Science Academic Scholarship in Service to Society: Our Role and Responsibility." Seventeen venues were selected among 20 applicants. Most venues involve more than one host school. Host schools include: Carnegie Mellon University and University of Pittsburgh; Clemson University; Georgia Tech; Michigan State University and Wayne State University; North Carolina State University; Old Dominion University; Rice University, University of Houston and University of Texas-Austin; Wilkes University; University of California-Merced; University of Cincinnati; University of Iowa; University of Minnesota; University of Nebraska-Lincoln; University of Rhode Island; University of Tennessee-Knoxville; University of Washington; University of Wisconsin.

6. Invited Keynote Speaker: The Microbiology of Drinking Water Systems in Shrinking and Expanding Resource-Constrained Cities and the Link to Public Health. International Water Association Microbial Ecology of Water Engineering (MEWE) Biannual Conference, Hiroshima, Japan, November 2019.
7. Invited Keynote Speaker: Achieving Resource Efficiency through Urine Separation and Nutrient Recovery: Advancing Hybrid Solutions for a Sustainable Future. Virginia Water Environment Association Education Seminar, May 8-9, 2019, Richmond, VA.
8. Invited Plenary Speaker: Shrinking and Expanding Urban Water Systems in Resource-Constrained Cities: the Link to Public Health. TransCon2019: Understanding and Managing Microbial Transformation of Environmental Contaminants, Monte Verita, Asconia, Switzerland. April 28 to May 3, 2019.
9. Invited speaker: The Microbial Characteristics of Drinking Water in Flint, MI: The Point-of-Use "Lead" Filter Field Study. Texas A&M University Department of Civil Engineering Environmental and Water Resources Seminar Series. March 4, 2019.
10. Invited speaker: Progress with Source Separation and Conversion to Fertilizer. Water Environment Federation Forum 2019: James Barnard Research Conference on Emerging Themes on Biological Phosphorus Removal and Recovery. January 14-15, 2019, Austin, TX.
11. Invited speaker: A Field Study of Microbial Changes Across Activated Carbon Block Point of Use Filters Deployed During the Flint Water Crisis. University of California-Davis. May 22, 2018.
12. Keynote speaker. "Water Infrastructure in Shrinking and Expanding Cities: The Impact on Water Quality and Public Health". Integrity of Creation Conference, The Global Water Crisis, Duquesne University. September 27-28, 2017, Pittsburgh, PA.
13. Invited speaker: Microbiome at the Global Tap: Understanding Microbial Colonization of Point-of-Use Drinking Water Filters. 14th Annual USEPA Drinking Water Workshop: Small Systems Challenges and Solutions, Cincinnati, OH, August 22-24, 2017.
14. Distinguished Lecture. Borchardt and Glysson Collegiate Professorship Induction. "At the interplay of water and health." Borchardt Conference, University of Michigan, February 22, 2017.
15. Distinguished Lecture. "The interplay between chemicals and microbiomes: an environmental biotechnology perspective." Wayne State "Water at Wayne" Lecture Series, Feb 1, 2017.
16. Invited speaker. "Microbiome at the Global Tap: Understanding microbial colonization of point-of-use drinking water filters." Marquette University, January 25, 2017
17. Invited speaker. "A Balancing Act: Achieving Nutrient Recovery via Urine-Derived Fertilizers while Managing Emerging Contaminants." University of Buffalo, November 11, 2016.
18. Distinguished Lecture. "At the Confluence: Nutrients, Trace Chemicals and Sustainability in the Urban Water Sector." Cornell University, October 24, 2016.
19. AEESP Distinguished Lecturer. 2015-2016 academic year. Presented one of two talks: "The Interplay Between Chemicals and Microbiomes: An Environmental Biotechnology Perspective", or "At the

RESOLUTION NO.: 210229

PRESENTED: MAY 19 2021

ADOPTED: _____

RESOLUTION FOR THE APPOINTMENT OF SHAWN P. MCELMURRY TO THE WATER SYSTEM ADVISORY COUNCIL

BY THE MAYOR:

WHEREAS, pursuant to the State of Michigan's administrative rules section 325.10410(7), water supplies serving a population of 50,000 or more, and consecutive systems serving a population of 50,000 or more, shall create a water system advisory council;

WHEREAS, the council shall consist of at least five members, appointed by the community supply;

WHEREAS, the purpose of this council is to improve transparency in the City of Flint community by developing materials and advising the water system on public awareness and education efforts.

WHEREAS, to be eligible for appointment to the council, an individual shall have a demonstrated interest in or knowledge about lead in drinking water and its effects;

WHEREAS, the council will develop plans for continuing public awareness about lead in drinking water, even when the action level is not exceeded,; review public awareness campaign materials provided by the statewide drinking water advisory council to ensure the needs and interest of the community, considering the economic and cultural diversity of its residents, are addressed; advise and consult with the water supply on the development of appropriate plans for remediation and public education to be implemented if a lead action level is exceeded; advise and consult with the water supply on efforts to replace private lead service lines at locations where the owner declined service line replacement; assist in promoting transparency of all data and documents related to lead in drinking water within the water supply service area

WHEREAS, Mayor Neeley desires to appoint Shawn P. McElmurry to the Water System Advisory Council (See Attached Resume).

NOW THEREFORE BE IT RESOLVED, that Mayor Neeley hereby appoints Shawn P. McElmurry, address 2153 Engineering Building 5050 Anthony Wayne Drive, Detroit, MI 48202 to serve on the Water System Advisory Council.

APPROVED AS TO FORM:

Angela Wheeler (May 13, 2021 13:09 EDT)

Angela Wheeler, City Attorney

FOR THE CITY OF FLINT:

Sheldon A. Neeley, Mayor

APPROVED BY CITY COUNCIL:

Kate Fields, City Council President

CITY OF FLINT

RESOLUTION STAFF REVIEW FORM

TODAY'S DATE: *05/13/2021*

BID/PROPOSAL#

AGENDA ITEM TITLE: RESOLUTION APPOINT MEMBERS TO THE WATER SYSTEM ADVISORY COUNCIL

PREPARED BY: Lottie Ferguson, Chief Resilience Officer
(Please type name and Department)

VENDOR NAME: N/A

BACKGROUND/SUMMARY OF PROPOSED ACTION:

In July 2018, the State of Michigan's Department of Environment, Great Lakes and Energy (EGLE) established the Lead and Copper Rule (LCR) under the Michigan Safe Water Drinking Act 399.
The purpose of the LCR is to minimize lead and copper in drinking water and indicates that a Water System Advisory Council (WSAC) is to be established on behalf of cities with 50,000 or more people served by its municipal water system. The WSAC is responsible for assisting with public awareness to create transparency and consumer confidence through statewide efforts of public education and action steps to ensure water quality through: water sampling, water treatment and lead service line replacement. A Council shall consist of a least five members appointed by the community supply. To be eligible for appointment to Council, an individual must have a demonstrated interest in or knowledge about lead in drinking water and its effects. At least one member must be a local resident who does not formally represent the interest of any incorporated organization.
In June 2019, the City of Flint began to establish a board for the WSAC by sending letters of interest to various community partners and members. The process of establishing the board did not see completion and was then put on hold due to a change in City administration. The open public meeting was also delayed due to the COVID-19 pandemic.

In February 2021, the Office of Public Health (OPH) sent notices of participation to public health community partners and community members and requested resumes of those individuals in order to submit an approval to Flint City Council to officially establish the Water System Advisory Council. The WSAC will be hosted by the City's OPH, who will organize and oversee the annual meeting, according to the Open Meetings Act 267. This annual meeting will inform and include the public on the City's lead and copper status, progress and next steps.

The names of the individuals who are Mayoral appointed to the Water System Advisory Council are: Dr. Lawrence Reynolds, Shawn P. McElmurry, PhD, and Benjamin Pauli, PhD, Environmental The designated Appointees have either lived or worked within the Flint community during the Flint Water

CITY OF FLINT

Crisis and have expressed interest and knowledge concerning lead in drinking water. Appointees resumes are attached.

It is the desire of the City to submit the approval of appointing members to complete the Water System Advisory Council, to Flint City Council. If approved, the City of Flint will, be in compliance with the Lead and Copper Rule required by the State of Michigan; create transparency with Flint residents; avoid any monetary penalties associated with the non-compliance of establishing the Water System Advisory Council.

FINANCIAL IMPLICATIONS: There is no budget required to establish or sustain the Water System Advisory Council.

BUDGETED EXPENDITURE? YES ☐ NO X☐ IF NO, PLEASE EXPLAIN:

Dept.	Name of Account	Account Number	Grant Code	Amount
Public Health	Water System Advisory Council	N/A	N/A	$0
		FY20/21 GRAND TOTAL		**$0**

PRE-ENCUMBERED? YES ☐ NO ☐ REQUISITION NO:

ACCOUNTING APPROVAL: _____ **Date:** _____

WILL YOUR DEPARTMENT NEED A CONTRACT? YES ☐ NO x ☐
(If yes, please indicate how many years for the contract) YEARS

WHEN APPLICABLE, IF MORE THAN ONE (1) YEAR, PLEASE ESTIMATE TOTAL AMOUNT FOR EACH BUDGET YEAR: (*This will depend on the term of the bid proposal)*

CITY OF FLINT

BUDGET YEAR 1 $0

BUDGET YEAR 2 $0

BUDGET YEAR 3 $0

OTHER IMPLICATIONS (*i.e., collective bargaining*):

STAFF RECOMMENDATION: *(PLEASE SELECT):* X☐ **APPROVED** ☐ **NOT APPROVED**

DEPARTMENT HEAD SIGNATURE: Lottie Ferguson, Chief Resilience Officer
(PLEASE TYPE NAME, TITLE)

SHAWN P. MCELMURRY, PhD, PE

2158 Engineering Building
5050 Anthony Wayne Dr
Detroit, MI 48202

Office: (313) 577-3876
E-mail: s.mcelmurry@wayne.edu

EDUCATION

Ph.D. Environmental Engineering, Michigan State University, 2008

Dissertation: *Characterization of Dissolved Organic Carbon: Assessment of Copper Complexation and Export of Carbon from Watersheds as a Function of Land Use*

Co-Advisors: *Thomas C. Voice and David T. Long*

M.S. Environmental Engineering, Michigan State University, 2002

B.S. Chemistry major, Central Michigan University, 1998

EXPERIENCE

2014-current *Associate Professor*, Department of Civil & Environmental Engineering, Wayne State University

2008-2014 *Assistant Professor*, Department of Civil & Environmental Engineering, Wayne State University

RESEARCH PROJECTS IN LAST 5 YEARS *(PI listed first, otherwise co-PI unless noted)*

2018-2022 McElmurry, S.P.; Seeger, M; O'Donnovan, K.; Sobeck, J.; Smith, R.; Kilgore, P.; Love, N.G.; Kerkez, B.; MacDonald Gibson, J.A. *CRISP 2.0 Type 2: Collaborative Research: Water and Health Infrastructure Resilience and Learning (WHIRL). National Science Foundation. Award #1832692 ($1,570,000), 9/1/2018-8/31/2022*

2020-2021 *Harris, A.; Crouch, P.; McElmurry, S.P. Urban Residential Soil Lead Remediation Strategies Project. Erb Family Foundation, subcontract through EcoWorks, Cayuse Award #A17-0555. 1/1/2020-12/31/2021.*

2018-2019 Dittrich, T.; Allen, M.; Boukhalfa, H.; Migdissov, A.; Mohanty,S.; McElmurry, S.P. *AOI 2 Coupled Hydrothermal Extraction and Ligand-Associated Organosilica Media Recovery of REEs from Coal Fly Ash.* U.S. Department of Energy. Award #DE-FE0031565 ($538,849 total)

2017-2019 Harris, A.; Crouch, P.; McElmurry, S.P. Urban Residential Soil Lead Remediation Strategies Project. Erb Family Foundation, subcontract though EcoWorks, Cayuse Award #A17-0555. 6/1/2017-12/31/2019. (subcontract $64,646)

2016-2017 McElmurry, S.P.; Kilgore, P.; Sobeck, J.; Seeger, M.; Zervos, M.; Sullivan, L. (+17 other investigators); *Flint Area Community Health and Environment Partnership (FACHEP) – PHASE II* State of Michigan, Contract #20163753-00. 6/1/2016-12/21/2017 ($3,350,000 total)

2016-2017 McElmurry, S.P. *RAPID: Chemical treatment efficiency of point-of-use filters deployed in Flint, Michigan* National Science Foundation, Award #1633013 ($49,992 total)

2016-2018 McElmurry, S.P.; Miller, C.J.; Pitts, D.K.; Sackey, D.J.; Seeger, M.; Masten, S.J.; Hanna-Attisha, M. *Rapid Response to Contaminants in Flint Drinking Water.* National Institute of Health; National Institute of Environmental Health Sciences. Award # 1R21ES027199-01 ($422,110 total)

2016 McElmurry, S.P.; Kilgore, P. Seeger, M.; Zervos, M.; Sullivan, L. *Flint Area Community Health and Environment Partnership (FACHEP) – PHASE I* State of Michigan ($123,091 total)

2015-2018 Nassauer, J., McElmurry, S.P., Sampson, J., Webster, J., Dewar, M., Alvarez, A., Schulz, A., Burton, A., Riseng, C. *Providing support for watershed based policy and management decisions: Lake Erie and City of Detroit.* Erb Family Foundation, subcontract through The University of Michigan ($1,116,999 total; 82,392 subcontract)

2015-2018 Zhang, Y., Zhou, K, Lemke, L., McElmurry, S.P. (senior personnel) *An Integrated Approach to Ensuring Food Safety and Sustainability in Urban Agriculture in the Greater Detroit Area* US Department of Agriculture, grant # 2015-70001-23424 ($272,532 total)

2015-2016 Zhang, Y., Lemke, L., Zhou, K., McElmurry, S.P. *Heavy metals and the development of antibiotic resistance in urban agriculture.* Center for Urban Responses to Environmental Stressors (CURES) Pilot Project funded through National Institute of Health Grant P30 ES020957 ($80,000 total)

2015 Miller, C., Zhang, Y., McElmurry, S, Lemke, L., Pothukuchi, K. *A Workshop for Integrative and Sustainable Food, Energy, and Water in Transitioning Urban Landscapes.* National Science Foundation, CBET Award # 1541869 ($28,840 total)

2014-2016 Caruso, J.A.; McElmurry, S.P.; Moldenhauer, J.; Reynolds, R.; Sackey, D.; Schroeck, N; Stemmer, P; Westrick, J.; Zhang, K; Giblin, F. *Petcoke in an urban environment: A community-based participatory model.* Center for Urban Responses to Environmental Stressors (CURES) Pilot Project funded through National Institute of Health Grant P30 ES020957 ($150,000 total)

AWARDS, CERTIFICATES, HONORS, and LICENSURE

2014, 2015 *Outstanding Reviewer Award,* Journal of Environmental Engineering, American Society of Civil Engineers

2013 *2013 ExCEEd New Faculty Excellence in Teaching Award,* American Society of Civil Engineering

2012 *Outstanding Faculty Service Award,* Engineering Student and Faculty Board, College of Engineering, Wayne State University

2012 *Favorite Professor Award,* Wayne State University

2010, 2011 *Assistant Mentor ASCE ExCEEd Teaching Workshop*–American Society of Civil Engineering (ASCE) – U.S. Military Academy, West Point, NY

2010 *Michigan Professional Engineering License* (#6201057641, date issued 09/24/2010)

2009 *ExCEEd Fellow* –American Society of Civil Engineering (ASCE)

PEER REVIEWED PUBLICATIONS FROM LAST 5 YEARS

**corresponding author, §graduate student, †undergraduate student*

[48] §Alla, L.N.R; §Monshi, M; §Siddiqua, Z, §Shields, J.; §Alame, K.; §Wahls, A; §Akemann, C.; §Meyer, D; §Crofts, E.J.; §Saad, F.; §El-Nachef, J.; §Antoon, M.; §Nakhle, R.; §Hijazi, N.; §Hamid, M.; §Gurdziel, K.; **McElmurry, S.P.**; Kashian, D.R.; Baker, T.R.; *Pitt, D.K. (2021) *Detection of endocrine disrupting chemicals in Danio rerio and Daphnia pulex: Step-one, behavioral screen.* Chemosphere, *271*, p.129442. DOI:10.1016/j.chemosphere.2020.129442

[47] Salim, A.; *Kilgore, P.; Mudall, G.; **McElmurry, S.P.**; Zervos, P.K.; (2020) *Trends in Legionnaires' disease-associated hospitalizations, United States, 2006—2010.* Open Forum Infectious Diseases. DOI: 10.1093/ofid/ofaa296

[46] *§O'Shay-Wallace, S.; Day, A.M.; §Islam, K.; **McElmurry, S.P.**; Seeger, M.W. (2020) *Boil Water Advisories as Risk Communication: Consistency between CDC Guidelines and Local News Media Articles.* Health Communication. DOI: 10.1080/10410236.2020.1827540

[45] *Sobeck, J.; Smith-Darden, J.; Hicks, M.; Kernsmith, P.; Kilgore, P.E.; Treemore-Spears, L.; **McElmurry, S.P.** (2020) *Stress, Coping, Resilience and Trust during the Flint Water Crisis. Behavioral Medicine.* 46(3-4) DOI: 10.1080/08964289.2020.1729085 (PMID: 32787730)

[43] *§Day, A.M.; §O'Shay-Wallace, S.; Seeger, M.W.; **McElmurry, S.P.** (2020) *Gender and Presence of Children: Examining Media Uses, Informational Needs, and Source Preferences during the Flint, Michigan Water Crisis.* Journal of International Crisis & Risk Communication Research DOI: 10.30658/jicrcr.3.2.2.

[42] *Zahran, S.; Mushinski, D.; **McElmurry, S.P.**; Keyes, C. (2020) Water Lead Exposure Risk in Flint, Michigan after Switchback in Water Source: Implications for Lead Service Line Replacement Policy. Environmental Research. 181, 108928. DOI: 10.1016/j.envres.2019.108928 (NIHMSID: 1552950; PMID: 31787215)

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For complete list go to: https://scholar.google.com/citations?user=vtHjmu8AAAAJ&hl=en

OTHER ACADEMIC OUTPUT AND UNIVERSITY SERVICE (select, last 5 years)

- Love, N.G.; Jackson, R.; McElmurry, S.P. (2019) Water stays in the pipes longer in shrinking cities – a challenge for public health. The Conversation. 24 May 2019. https://theconversation.com/water-stays-in-the-pipes-longer-in-shrinking-cities-a-challenge-for-public-health-116119
- Love, N.G., Gebrie, G.S., Adejumo, H.A., McElmurry, S.P. (2019) Drinking Water Infrastructure in Shrinking and Expanding Cities: The Impact on Water Quality and Public Health. In G. Magil and J. Benedict (Eds) Cascading Challenges in the Global Water Crisis. Chapter Three (p. 23-39), Cambridge Scholars Publishing, ISBN: 978-1-5275-2447-7
- Zarb, A.R, McElmurry, S.P., Moldenhauer, J.A. (2017) *Technical to Teachable: The Flint Water Crisis and the Design of Instructions for Assembling Water Sampling Kits.* In *Design, User Experience, and Usability: Theory, Methodology, and Management*, Springer.

- Zahran, S., Laidlaw, M.A.S., McElmurry, S.P., Filippeli, G.M., Taylor, M. (2015) Linking Source and Effect: Re-suspended Soil Lead, Air Lead, and Children's Blood Lead Levels in Detroit, Michigan. In A. Hassan (Ed) *Everyday Environmental Toxins: Children's Exposure Risks* (p. 163-181). Apple Academic Press: Waretown, NJ, ISBN: 978-1-77188-101-2
- US EPA Workshop titled Michigan Water, Public Health and Healthcare Coordination Workshop, 9/16/2019, Wayne State University, Detroit, MI (Organizer and presenter)
- US EPA Webinar titled A Critical Connection: The Water and Healthcare/Public Health Sectors Webinar - Healthcare/Public Health Sector Focus, 9/26/2019 (Presenter)
- US EPA Webinar titled A Critical Connection: The Water and Healthcare/Public Health Sectors Webinar - Water Sector Focus, 9/19/2019 (Presenter)

TEACHING AND ADVISING

Undergraduate Courses

CE4210 – Introduction to Environmental Engineering (2014, 2015)
CE4140 – Environmental Engineering Design (2017, 2018, 2019, 2020)
CE5220 – Environmental Chemistry (2014, 2016)
CE5230 – Water Supply and Wastewater Engineering (2017, 2019, 2021)
CE5995 – Special Topics: Advanced Drinking Water Treatment (2016, 2019)

Graduate Courses

CE 6150 – Hydrologic Analysis and Design (2015, 2018, 2020)
PSC/CE6910 – Waste Pharmaceuticals: Environmental Impact and Management (2015)
CE7260 – Surface Water Quality Modeling (2015)
CE7580 – Environmental Remediation (2016)
CE7995 – Special Topics: Advanced Drinking Water Treatment (2016, 2019)

Committee Chair of 4 Ph.D. and 4 M.S. Thesis Students

Committee Member of 15 Ph.D. and 4 M.S. Thesis Students

OTHER SERVICE

Committee Assignments

- Michigan State University Department of Civil and Environmental Engineering Professional Advisory Board (2016-current)
- Graduate Program Officer, Department Civil & Environmental Engineering (2014-2016, 2020- current)
- College of Engineering P&T Committee (2016-2019)
- Wayne State University Water Safety Committee (2018-current)
- Technical Advisory Committee, Flint, MI (2015-current)
- *Great Lakes Science Advisory Board's Taking Action on Lake Erie (TAcLE) work group (2012-2013). Work resulted in the following report:*

  Lake Erie Ecosystem Priority | Scientific Findings and Policy: Recommendations to Reduce Nutrient Loadings and Harmful Algal Bloom, Draft Summary Report, August 2013. International Joint Commission. Available at: http://www.ijc.org/files/tinymce/uploaded/Draft%20LEEP-Aug29Final.pdf

Public Presentations as an Expert in Discipline

- *Featured in "Flint's Deadly Water" produced by FRONTLINE, SEASON 2019: EPISODE 16; premiered September 10, 2019 on PBS. Available at https://www.pbs.org/wgbh/frontline/film/flints-deadly-water.*
- *67TH DISTRICT COURT FOR THE COUNTY OF GENESEE. THE PEOPLE OF THE STATE OF MICHIGAN v. NICHOLAS LYON (Nov. 15, Dec. 1, 2017)*
- *67TH DISTRICT COURT FOR THE COUNTY OF GENESEE. THE PEOPLE OF THE STATE OF MICHIGAN v. EDEN WELLS (Dec. 11, 12, 2017)*
- *Featured technical expert on Secrets of the Earth: Mother Nature Reclaims Buildings, a TV show that premiered on the Weather Channel on October 27, 2014*
- *WJBK-TV Health Works, My Fox Detroit. Interviewed regarding Pb research (~133,000 viewers), Aired June 14, 2013 http://www.myfoxdetroit.com/video?autoStart=true&topVideoCatNo=default&clipId=8991514*
- *WDET-Radio Interview discussing resuspension of Pb, Aired March 19, 2013*

Proposal Review Panels

- National Institute of Environmental Health Sciences – Special Emphasis Panel
- National Institute of Environmental Health Sciences – Research to Action: Assessing and Addressing Community Exposures to Environmental Contaminants
- National Institute of Health - Social Sciences and Population Studies Study Section

- National Science Foundation - Civil, Mechanical and Manufacturing Innovation
- National Science Foundation – Chemical, Bioengineering, Environmental, and Transport Systems
- National Science Foundation - Geography and Spatial Sciences

Editorial Board Memberships

- *Toxics* (ISSN 2305-63040; Impact Factor = 3.271)

Reviewer

- *Applied Geochemistry*
- *Aquatic Geochemistry*
- *Chemosphere*
- *Desalination Water Treatment*
- *Elementa: Science of the Anthropocene*
- *Environmental Geochemistry & Health*
- *Environmental Research*
- *Environmental Science & Technology*
- *Environmental Science & Technology Letters*
- *Environmental Science: Processes & Impacts*
- *Environmental Science: Water Research & Technology*
- *Geohealth*
- *International Journal of Distributed Sensor Networks*
- *Journal of Environmental Engineering*
- *Journal of Environmental Pollution*
- *Journal of Exposure Science and Environmental Epidemiology*
- *Journal of Health and Place*
- *Landscape Architecture*
- *Photogrammetric Engineering and Remote Sensing*
- *Proceedings of the National Academy of Sciences*
- *Science of the Total Environment*
- *Sustainable Chemistry*
- *Toxics*
- *Water Science and Technology: Water Supply*

RESOLUTION NO.: 210313

PRESENTED: JUN 28 2021

ADOPTED: _____

RESOLUTION RECOMMENDING THE APPOINTMENT OF MILDRED SILVA ZUCCARO TO THE HURLEY HOSPITAL BOARD OF MANAGERS

BY THE MAYOR:

WHEREAS, Rev. Daniel S. Scheid's term on the Hurley Board of Managers expires April 30, 2022; and

WHEREAS, Rev. Scheid is unable to complete his appointed term and has resigned from the board; and

WHEREAS, Mayor Sheldon A. Neeley recommends the appointment of Mildred Silva Zuccaroo of Flint to replace Rev. Scheid.

THEREFORE BE IT RESOLVED that the Flint City Council approves the appointment of Mildred Silva Zuccaro to serve the remainder of a five year term on the Hurley Board of Managers, commending June 29, 2021 and expiring April 30, 2022.

APPROVED AS TO FORM:

Angela Wheeler

Angela Wheeler, Chief Legal Officer

FOR THE CITY OF FLINT:

Mayor Sheldon A. Neeley

APPROVED BY THE CITY COUNCIL:

City Council President

MILDRED SILVA ZUCCARO

810.280.5154 | Flint, MI | mildredsilvazuccaro@gmail.com

Greetings Board Managers of Hurley Medical Center,

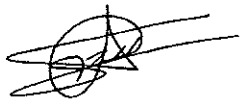
It is with great enthusiasm that I submit my interest and candidacy for a board manager position for the Hurley Medical Center. I am highly motivated and find this position as the ideal opportunity to contribute the skills I have gained from my professional experience, academic studies, and diverse background. My drive and values are aligned with the mission and vision of Hurley Medical Center, with a broad work experience in healthcare in both public health sector and as a medical physician I embody the skill set and connection to the Flint community ideal for the board manager position.

My organizational and logistical skills are well demonstrated in my professional experience including direct patient care and surgery to education, public health and research settings. My performance in my previous position, as Latinx Culture Ambassador, demonstrates my deep connection to the community and awareness of the local social service landscape. In addition to my practice and experience in medicine, I had the amazing opportunity to facilate diversity dialoges and Spanish language instruction in aims to increase access and improved patient care. In my current role as a communty outreach and enrollment navigator for Hamilton Community Health Network I have the opportunity to increase access to medical care by instituting equitable practices addressing language and cultural barriers and enrolling clients into health care.

I am prepared and enthusiastic about the board position. I have strong experience in being an exponent for healthy living, and have in-depth experience in strategies to increase access and service to communities. I am a foreign medical graduate and am preparing for the beginning stages of obtaining my license to practice medicine in the U.S.

I am thrilled by the opportunity to combine my administrative skills with my passion for public health by serving as a board member for Flint's Hurley Medical Center. Thank you for your time and consideration, and I would love the opportunity to further illustrate my experience, knowledge, and skillset.

Respectfully,



Mildred Silva-Zuccaro

MILDRED SILVA ZUCCARO

810.280.5154 mildredsilvazuccaro@gmail.com

PROFESSIONAL SUMMARY

Broadly experienced health care professional with strong connection to local Spanish Speaking community. Highly educated medical graduate of the Universidad Cristobal Colon with a degree of Medical Surgery. Supeior care and conduct managment practice applied through perfoming patient care procedures including consultations, diagnosis and health plan implementation. Expansive knowledge of local institutaions and non-profit organizations. Accomplished research abilites with published work in International Journal.

PROFESSIONAL EXPERIENCE

Outreach and Enrollment Navigator

Hamilton Community Health Network/ Flint, MI/ *Jan.2021-present*
-Identify and establish community engagement strategies to increase access to medical care and enrolment in health coverage with attention to Flint's Latinx and Spanish speaking community.

Latinx Culture Ambassador

Latinx Tech & Community Center/ Flint, MI/ *Mar.2018-2020*
-Connected and aided Spanish-speaking community memebers by serving as an interpreter to assist in navigating various organizations and insitutions to obtain services, enroll in programs and recieve resources.

Diversity Facilitator & Language Instructor

MSU College of Human Medicine/ Flint, MI/ *Mar.2018-present*
-Facilitate diversity dialogues concentrated in Latinx cultural partices and basic Spanish language instruction for culturally enriched patient care education medical students.

EDUCATION

Universidad Cristobal Colon Boca del Rio, Ver., Mexico.
Bachelor of Medical Surgery September 27, 2014. 8.58

Undergraduate Internship General Hospital of IMSS Cardel, Ver,. Mexico
July,2012-June,2013. 9.4

Social Service
Rural Hospital of IMSS Papantla, Ver., Mexico.
Agust, 2013- July 2014

Surgical Technician Assistant

McLaren Greater Lansing/ Lansing, MI/ *Sept.2018-Dec. 2018*

-Performed preoperative and postoperative duties to better facilitate efficiency in the operating room demonstrating expert knowledge of sterile techniques.

General Physician & Consultations

Milleniun Hospital/Veracruz, Ver./Nov.2014-Jan. 2016

-Conducted physical examinations of patients to develop treatment plans with careful consideration to patient preferences, clinical data and risks and benefits of treatments.

Social Service

Rural Hospital of IMSS/Papantla, Ver. August 2013-July 2014

-Provided medical care and attention at rural hospital concentrating on healthy outcomes for pregnant women in labor and delivery with high concentration of native indigenous populations.

PUBLICATION(S)

International Journal for Vitamin and Nutrition Research
December 07,2015 Ref.:Ms. No. IJVNR-D-15-00085R3
Tissue changes in the development of fatty liver by chronic ingestion of sucrose associated with obesity and dyslipidemia in rats.

EDUCATIONAL COURSES

Aesculapyus
ENARM Course
January, 2021

Cardiopulmonary
Resucitation AHA
October, 2017

Gynecology and
Obstetrics
October,2014
Boca del Rio, Ver.,
Mexico

CERTIFICATION(S)

Community Interpreter
Cross Cultural
Communications
May, 2021

Great Lakes Bay
Hispanic Leadership
Institute
SVSU
January, 2020

LANGUAGE

English
Spanish

RESOLUTION: 210335

PRESENTED: 7-21-21

ADOPTED:

Resolution Recommending the Reappointment of Matthew Telliga to the Zoning Board of Appeals

BY THE CLERK:

Matthew Telliga's term on the Zoning Board of Appeals expired August 31, 2020, however, he has since that time continued to serve; and

Councilperson Allan Griggs recommends the reappointment of Matthew Telliga (3330 Westwood Parkway, Flint, MI 48503) to another three-year term.

THEREFORE, BE IT RESOLVED, the Flint City Council approves the reappointment of Matthew Telliga to the Zoning Board of Appeals for a three-year term, beginning immediately and expiring August 31, 2023.

APPROVED AS TO FORM:

Angela Wheeler, Chief Legal Officer

APPROVED BY FLINT CITY COUNCIL:

Kate Fields, City Council President

Matthew D. Telliga

3330 Westwood Pkwy Flint, MI 48503 | 810.287.1637 | Telliga03@comcast.net

Education

Bachelor of Business Administration (with Academic Distinction)

University of Michigan-Flint

Flint Southwestern High School with High Honors

PROFFESSIONAL EXPERIENCE –Retired Sales Executive

Ortho McNeil Division of Johnson and Johnson

Territory Manager in Pharmaceutical Pain Management Division, increased territory by 50% in first year. Training expertise in: Opioids, PPIs, Antibiotics and Pain Management

Standard Register Corporation

Account Executive Strategic Healthcare Accounts

Responsible for Sales of Document Management, Document Security, Print Management, Consulting and Business Solutions Sales Volume leader entire career with over $30 million in personal sales, Received President's Award as leading sales in Nation

Community Involvement/Leadership

Chairman, City of Flint Zoning Board of Appeals 2019-present

Recent Community Involvement/Leadership

Commissioner/Vice Chairman ZBA City of Flint 2017-2019

Flint Institute of Music, Board of Trustees 1999-2019

Councilman, City of Grand Blanc, 2011-2015 Committees served: Public Safety, Department of Public Works

Zoning Board of Appeals City of Grand Blanc 2011-2015

Fire Commissioner, Grand Blanc Area Fire Department

2 Term Chair, University of Michigan Flint Board of Governors, 10 years on Board

University of Michigan Ann Arbor, Member Alumni Board of Directors