

**State of Iowa  
Iowa Energy Center Board  
Meeting Minutes of February 11, 2021  
Teams/Telephonic Meeting Only**

**Call to order 1:00 p.m.**

**Board Members Present**

Joel Schmidt, Board Chairperson  
Dan Nickey, Board Vice Chair  
Stuart Anderson  
Jennifer Johnson  
Gul Kremer (joined at 1:10 p.m.)  
Jenae Jenison  
Debi Durham  
Geri Huser  
Troy DeJode  
Timothy Whipple (joined at 1:06 p.m.)  
Valerie Newhouse  
Rick Olesen

**Board Members Absent**

Nathan Young

**Iowa Economic Development Authority Staff Present**

Brian Selinger  
Amber Buckingham  
Stephanie Weisenbach  
Ryan Young  
Terry Roberson  
Lisa Connell  
Shelly Peterson  
Betty Hessing  
Kanan Kappelman  
Emily Hockins  
Staci Hupp-Ballard  
MK Anderson  
Jill Lippincott  
Jeff Geerts  
Beth Balzer

**Others Present**

Dr. Craig Just, University of Iowa  
Nathan Seberg, Baldrige Environmental Services  
Randy Seberg, Baldrige Environmental Services  
John Espeland, Polymer Crete, Inc.  
Troy Wright, Polymer Crete, Inc.  
Nick Wylie, J. Pettiecord Inc.  
Tanya Michener, Newton Development Corporation  
Julie Vande Hoef, Alliant Energy  
Alex Moon, IDNR  
Lori McDaniel, IDNR

Mark Scheid, Ulteig Engineers  
Brian Meng, Mid America Recycling  
Ethan Hohenadel, Iowa Association of Electric Cooperatives  
Chaz Allen, Iowa Utility Association  
Grace Seiler, GKAT Reclamation, LLC  
Senator Carrie Koelker, Iowa State Senator  
Representative Charles Isenhardt, Iowa House of Representatives  
Jeff Danielson, American Wind Energy Association  
Brenda Biddle, Iowa Utilities Board Staff

**Welcome & Introductions by Board Chairperson Joel Schmidt**

Joel Schmidt welcomed everyone to the February 11<sup>th</sup> IEC Board meeting.

**Roll Call by Betty Hessing, Administrative Assistant**

A quorum was established.

**Consideration of October 29, 2020, Meeting Minutes**

Motion by	Debi Durham
Motion	I move approval of the October 29, 2020 minutes.
Second	Dan Nickey
Voice Vote	All ayes in favor. Motion approved.

**Public Comment Period** – No comments.

**Fiscal Update – Attachment A**

Presentation provided by Terry Roberson. Terry Roberson stated the Financial Report for this meeting reflects expenditures paid through January 31, 2021. We have two columns on the Loans Receivable—one is for the inherited loans from Iowa State University when we assumed the program and the other column is for the recent loans awarded and issued under IEDA and the IEC Board as it now exists. Also attached is a copy of the Iowa Energy Center's Administrative Budget for FY21. Terry Roberson answered questions from Board Members.

**Alternate Energy Revolving Loan Program (AERLP)**

**Loan Program Update** – Stephanie Weisenbach stated we do not have any new loan applications for the Board to review or decide upon today, as we did not receive any submittals in this quarterly cycle. We have had a variety of inquiries about the program and she anticipates we will see applications for the May Board meeting agenda. We have been talking to the Loan Committee about the potential, future types of projects that the program might be able to consider if statutory changes are made, which we have discussed previously.

Stephanie Weisenbach asked if there were any questions. Dan Nickey asked for an update on the progress of what those discussions are. Stephanie Weisenbach asked Dan Nickey if he wanted to know the progress for the changes to the program and he replied that is what he meant. Stephanie Weisenbach referred to Brian Selinger, as Deanna Triplett could not attend the meeting today. Brian Selinger replied we are continuing to pull together information for the Loan Committee on the type of projects that could be embraced going forward. On the

statutory component, that process is in motion on the legislative enhancements. As soon as we know more, we will get that to you. Also, from Deanna Triplett, if any Board member would like to speak directly to her, let Brian know and he can get you her contact information. We will definitely keep you posted as we learn and know more.

### **Grant Program**

**Grant Program Update – Attachment B** - Amber Buckingham gave an update on the current status of the Grant Program. Currently all of the grants, except the one we will be discussing later today from the last round, have signed agreements and have started working on their projects. Amber Buckingham is currently working on setting reporting requirements with them. Meetings will be scheduled throughout the month of April to do a quick check-in. Amber is currently working on scheduling virtual and/or on-site monitoring visits for the grants that were awarded in 2019. We will be focusing on those in late February and early March.

Amber Buckingham stated that at the May Board meeting, she is planning to provide a status report with general updates on the progress of the grants. We will be about a year in, so good progress on all of those. At the next few Board meetings, we are planning to get a couple grant recipients to present their current results and get updates on those.

We are planning to launch the third round today if the approval of the Policies & Procedures document happens. We will plan to do a press release to stakeholders and parties who have indicated their interest in the program and all of our normal media contacts. We will also post that information on the IEDA web page and open up the pre-applications in IowaGrants.

We are planning to announce the future funding decisions at the August 5<sup>th</sup> Board meeting. A timeline is provided in your Board packets. So, we will open the pre-applications today and they will close on March 19<sup>th</sup> and then those funding decisions will be made at the August 5<sup>th</sup> Board meeting, barring any future delays. We are looking at an allocation of \$4M again. We will only fund those grants that meet those minimum score requirements set forth in the Policies and Procedures.

Amber Buckingham asked if there were any questions regarding the current or future program and no questions were asked.

### **Approve Amended Grant Program Policies & Procedures – Attachment C**

Amber Buckingham stated that in the Board packet is an updated copy of the Policies & Procedures. The main changes to the Policies & Procedures include cost share updated requirements, clarifications to reporting requirements and minor tweaks to the scoring matrixes for both the pre-application and the full-application phase.

Amber Buckingham stated that in your Board packets, the first major change is under the Eligible Applicants. We wanted to solidify that applicants can apply jointly with ineligible applicants, but the eligible applicant cannot simply act as a pass through to ineligible applicants.

Under Budgetary Requirements, we just changed the indirect cost basis. Previously, the indirect costs of the 20% of the IEC award were calculated on the total project budget. We have changed that to be based on the total IEC award request, just so it matches the policy for the cost share, so they are both based on the same number for clarity sake.

The most major change is the change to the Cost Share requirements. We have chosen to require cost share in this round of Energy Center funding. Previously, we did not require it. We wanted to keep that minimum cost share very low, so we have stuck with 5%, but we did feel it was important for applicants to have some skin in the game when they are applying for these funds. We did note that the in-kind donations can still be used for their cost share unless you are with private industry. If you are with private industry and you are asking for money for supplies and materials or equipment that will benefit you in the long run, post-grant, we are asking that applicants provide at least 10% of those budget line items as cost share. Amber Buckingham provided an example in the Policies and Procedures document. Applicants will still have the opportunity to obtain extra points if they do go over that 5%, so we did lower that threshold for extra points to 5.1%. Unrecovered indirect costs cannot be used as cost share and the cost share must be accounted for in the pre-application phase.

Amber Buckingham stated that the next change is we are requiring the application approval certification document in the pre-application phase since we do require that cost share--at that point it made sense to move that up to the pre-application phase.

We also updated the pre-application scoring matrix. We wanted to make sure the scoring matrix was weighted in the same manner that the full application was, so we had some weight to some of the scores. We are sticking with the 25 minimum score to move on to the full application phase, which is the same as it was during the last round.

In the full application, we added a bit of language in the evaluation criteria, especially for the first two sections. We wanted to clarify how we will be scoring these items. We added, "Does the benefit appear to be sound and reasonable for both of these?", and then "Does the fulfillment of the key focus area seem sound and reasonable?".

We did change this cost share piece, so we have included a couple extra points for those folks that have between 5.1 and 10 percent cost share.

We cleaned-up some of the information for the administration of the grants and we will be issuing a letter of intent along with the agreement, now that we have a nice shell that we can use for our recipients. We cleaned-up some of the language for clarification for reporting with some deadlines and due dates that we did not have in prior rounds of this document.

Amber Buckingham stated that was the end of the changes and asked if anyone had questions. Joel Schmidt asked if this had been reviewed and recommended by the Grant Committee and she replied it has been. Chairperson Schmidt entertained a motion.

Motion by Stuart Anderson  
Motion I move to approve the Amended Grant Program Policies & Procedures.  
Second Rick Olesen  
Roll Call Yes: 12 Abstain: 0  
Motion approved.

**Grant Award Declination – Building Enclosure Council – Attachment D**

Amber Buckingham explained the Iowa Energy Center Board approved a grant for the Building Enclosure Council of Iowa on September 17, 2020 in the amount of \$10,575. Upon receipt of the award letter, the recipient realized that the budget in the application was incorrect and they would not be able to complete the deliverables, as outlined in the application, with the funds that had been provided and approved. We had some internal discussion and feedback from the Grant Committee and the recipient has agreed to the rescission of their grant award and intends to submit a new pre-application during the upcoming grant cycle. We would propose the approval of the rescission of the grant award made on September 17, 2020 to the Building Enclosure Council of Iowa. They have provided a declination letter for your review.

Motion by Gul Kremer  
Motion I move to approve the rescission of the grant award made on September 17, 2020 to the Building Enclosure Council of Iowa.  
Second Dan Nickey  
Roll Call Yes: 12 Abstain: 0  
Motion approved.

Brian Selinger stated we have three presentations, but he would introduce the first two presenters together because of the tremendous synergy and partnership between these two organizations/companies. Brian Selinger introduced Dr. Just from the University of Iowa. This is an intriguing project that the Iowa Energy Office has had the privilege to be engaged in conversation with Dr. Just for at least a year. They were able to obtain IEDA's funding support at our December Board meeting and Brian thought the Board would find some value in hearing about what he is attempting to achieve and how that aligns with the mission of the Iowa Energy Center and advancements of the Iowa Energy Plan.

Directly following Dr. Just's presentation, Brian Selinger stated he is pleased to have with us Nathan and Randy Seberg from Baldrige Environmental Services. The second presentation, "Wastewater Case Studies to Prove Ratepayer Benefits in Underserved Iowa Communities" is one that you, as a Board, kindly provided grant support to.

**University of Iowa Wastewater & Waste-to-Energy Research Program – Attachment E**

Dr. Craig Just, Associate Professor, Civil & Environmental Engineering, with the University of Iowa, gave his presentation.

**Wastewater Case Studies to Prove Ratepayer Benefits in Underserved Iowa Communities – Attachment F**

Nathan & Randy Seberg, with Baldridge Environmental Services, gave their presentation.

Brian Selinger introduced John Espeland with Polymer Crete, Inc. Brian Selinger explained that IEDA was very pleased that this project opportunity came before us for funding consideration and support and we were able to provide a grant from our Federal Competitive Grant Program. We know how fortunate we are in Iowa for our robust wind resources—all the positive benefits that come with that—economically and environmentally. But there is never a perfect silver bullet solution on anything in life, so there are challenges, but those challenges can be turned into opportunities. So, this ability to take obsolete wind turbine blades and repurpose them and revalue them and try to keep those out of landfills, it jumped out at us as an opportunity. We are pleased to have John Espeland and his project team share some of their results and where they ultimately want to go with this.

**End of Life Wind Turbine Blade Recycling & Repurposing – Attachment G**

John Espeland with Polymer Crete, LLC gave a presentation.

**Other Business**

**Energy Office Updates**

Brian Selinger stated that we just put the finishing touches on the Annual Energy Center Report. Brian stated he will be emailing Board Members momentarily with a pdf copy of that. Also, it has just been posted to the IEDA website and very soon, it will be posted to the Legislative Portal so the Legislature will have a chance to view that.

We will be in touch as Grant and Loan Committee meetings draw near; we will circle back with you and keep you posted on the status of the legislative effort with the loan fund.

As we had folks come in and offer presentations, we will continue to be thoughtful about some topics and projects. Brian Selinger expressed to Board Members that if they have an interest or idea for presentation topics, please do not hesitate to reach out to him or an IEC team member. Brian thanked Board Members for their ample time and stated that some really good information was shared today.

**Next Quarterly Board Meeting** May 13, 2021, at 1:00 p.m.

Chairperson Schmidt asked for a motion to adjourn.

Motion by	Dan Nickey
Motion	I move to adjourn.
Second	Joel Schmidt

**Adjournment** 2:54 p.m.

Respectfully Submitted,  
Betty Hessing, Administrative Assistant

# ATTACHMENT A

IEDA									
Financial Report									
Iowa Energy Center									
Fiscal Year 2021									
January 31, 2021									
	<u>IEC MAIN ACCT</u>			<u>IEC/AEL LOAN ACCT</u>					
			Total			Total			
	Admin	Projects	Fund		Admin	Projects	Fund	<u>IEDA</u>	<u>OCT 1 2017</u>
								<u>NOTES REC</u>	<u>NOTES REC</u>
<u>Revenue</u>									
Cash Balance Forward	350,000	14,732,026	15,082,026		0	14,014,255	14,014,255	1,374,816	3,483,264
FY20 IUB Transfer	0	0	0		0	0	0		0
Principal Repayments YTD	0	0	0		0	1,169,740	1,169,740	(72,896)	(1,096,844)
Interest Revenue	0	20,540	20,540		9,399	9,399	18,798		0
Other Revenue YTD	0	0	0		0	0	0		0
Deappropriations	0	0	0		0	0	0		0
Transfers	0	0	0		0	0	0		0
Total Revenue YTD	350,000	14,752,566	15,102,566		9,399	15,193,394	15,202,793	1,301,920	2,386,420
<u>Expenses</u>									
Administration YTD	(136,497)	0	(136,497)		(2,852)	0	(2,852)		
Project Payouts YTD	0	(211,523)	(211,523)		0	0	0		
Leg Auth Transfers (18 Acts Ch 1172 Sec 91)			0				0		
Total Expense YTD	(136,497)	(211,523)	(348,020)		(2,852)	0	(2,852)		
<u>Obligations</u>									
Obligations C/F	0	3,076,832	3,076,832		0	1,600,091	1,600,091		
Current Year Obligations	0	2,721,102	2,721,102		0	77,158	77,158		
Current Year Rescissions			0			(64,375)	(64,375)		
Current Year Payouts	0	(211,523)	(211,523)		0	(1,499,803)	(1,499,803)		
Balance of Current Year Admin	213,503	0	213,503		6,547	0	6,547		
Net Obligations YTD	213,503	5,586,411	5,799,914		6,547	113,071	119,618		
Balance Available	0	8,954,632	8,954,632		0	15,080,323	15,080,323		







Report ID Sched 6 Detail Unit  
 Source I/3 Budget FINANCIAL INFORMATION SCHEDULE BY DETAIL UNIT  
 Spec Dept 270SD Fund 009F Unit Detail 26909AD  
 Department 269 Appropriation 0000 Recap Unit All

Page 1 of 3  
 Run Date 02/03/2021  
 Run Time 03 30 58 PM

**Special Department:** 270SD Economic Development Authority  
**Department:** 269 Economic Development Authority  
**Fund:** 009F IA Energy Center-Main  
**Appropriation:** 0000 Fund Only  
**Unit Detail:** 26909AD Iowa Energy Center Admin

**Object Class** Revised Budget  
 I/3 Financial  
 FY 2021

**RESOURCES**

**Receipts**

205R Reimbursement from Other Agencies

**Receipts TOTAL:**

**Other Resources**

01B Balance Brought Forward 350,000  
 (Funds)

**Other Resources TOTAL: 350,000**

**TOTAL RESOURCES: 350,000**

**DISPOSITION OF RESOURCES**

**Expenditures**

101 Personal Services-Salaries 289,514  
 202 Personal Travel In State 2,000  
 203 State Vehicle Operation 500  
 204 Depreciation 500  
 205 Personal Travel Out of State 10,000  
 301 Office Supplies 1,000  
 308 Other Supplies 1,000

Report ID Sched 6 Detail Unit

STATE OF IOWA

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Source I/3 Budget

FINANCIAL INFORMATION SCHEDULE BY DETAIL UNIT

Run Date 02/03/2021

Spec Dept 270SD Fund 009F Unit Detail 26909AD

Run Time 03 30 58 PM

Department 269 Appropriation 0000 Recap Unit All

Special Department: 270SD Economic Development Authority

Department: 269 Economic Development Authority

Fund: 009F IA Energy Center-Main

Appropriation: 0000 Fund Only

Unit Detail: 26909AD Iowa Energy Center Admin

		Revised Budget I/3 Financial
Object Class		FY 2021
309	Printing & Binding	1,000
313	Postage	500
401	Communications	1,000
402	Rentals	8,000
405	Professional & Scientific Services	24,486
406	Outside Services	500
408	Advertising & Publicity	2,000
409	Outside Repairs/Service	1,000
414	Reimbursement to Other Agencies	
418	IT Outside Services	5,000
503	Equipment - Non-Inventory	
602	Other Expense & Obligations	1,000
702	Fees	1,000
<b>Expenditures TOTAL:</b>		<b>350,000</b>
<b>TOTAL DISPOSITION OF RESOURCES:</b>		<b>350,000</b>

FTE

FTE Summary

Report ID Sched 6 Detail Unit

STATE OF IOWA

Page 3 of 3

Source I/3 Budget

FINANCIAL INFORMATION SCHEDULE BY DETAIL UNIT

Run Date 02/03/2021

Spec Dept 270SD Fund 009F Unit Detail 26909AD

Run Time 03 30 58 PM

Department 269 Appropriation 0000 Recap Unit All

Special Department: 270SD Economic Development Authority

Department: 269 Economic Development Authority

Fund: 009F IA Energy Center-Main

Appropriation: 0000 Fund Only

Unit Detail: 26909AD Iowa Energy Center Admin

Object Class		Revised Budget I/3 Financial
		FY 2021
FTE	FTE	3.00
<b>FTE Summary TOTAL:</b>		<b>3.00</b>
<b>TOTAL FTE:</b>		<b>3.00</b>

Unit Detail 26909AD Net (Res-Disp):

Unit Detail 26909AD FTE: 3.00

Appropriation 0000 Net (Res-Disp):

Appropriation 0000 FTE: 3.00

Fund 009F Net (Res-Disp):

Fund 009F FTE: 3.00

Department 269 Net (Res-Disp):

Department 269 FTE: 3.00

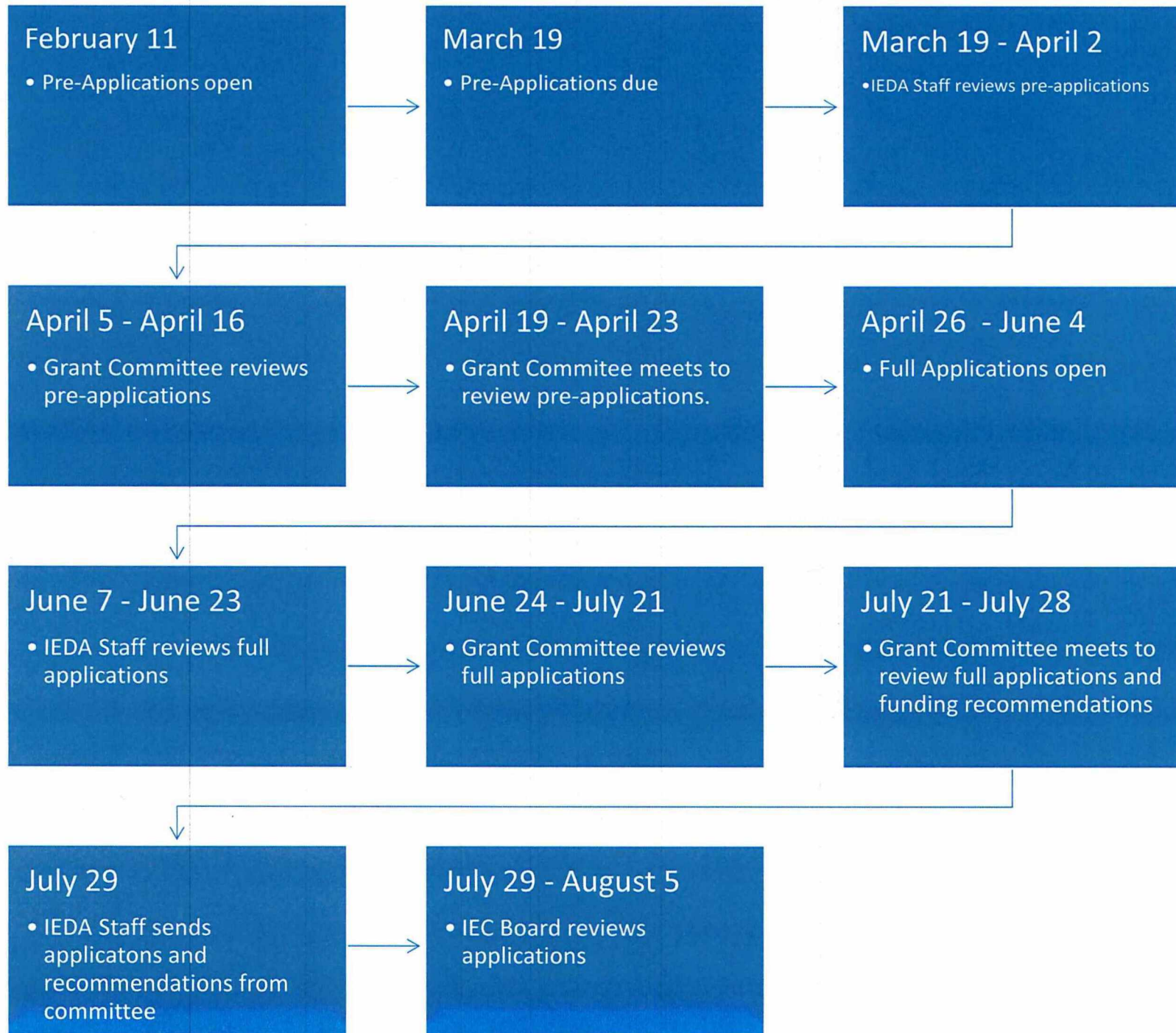
Special Department 270SD Net (Res-Disp):

Special Department 270SD FTE: 3.00

Report Total Net:

Report Total FTE: 3.00

# ATTACHMENT B



# ATTACHMENT C

ACTION

**REPORT**  
**IOWA ENERGY CENTER BOARD**  
**FEBRUARY 2021**

From: Energy Office

Subject: Iowa Energy Center Grant Program Policies and Procedures

**Background:** The Iowa Energy Center (IEC) Grant Program Policies and Procedures Handbook provides guidelines for the administration of the IEC Grant Program. As established by 261 *Iowa Administrative Code* 404.2, the Board must review the Grant Program Policies and Procedures Handbook annually.

The IEC Grant Committee members met in January to discuss potential changes to the Policies and Procedures Handbook for the third round of grant applications. Changes for the next round of applications include but are not limited to the following: updated cost share requirements, updates to reporting requirements, and updates to the scoring matrix for both the pre-application and full application phase. These changes will strengthen the Grant Program and provide clearer guidance to applicants and grant recipients.

The document “IEC Grant Program Policies and Procedures Round Three Handbook” is attached.

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<b>Proposed Motion:</b>	<b>Approve the Changes to the Iowa Energy Center Grant Program Policies and Procedures Handbook</b>
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Submitted By: Amber Buckingham

Attachments: IEC Grant Program Policies and Procedures Round Three Handbook

**Iowa Energy Center Policies and Procedures Handbook  
Iowa Economic Development Authority  
February 2021**

**Fiscal Year Allocation:** \$4 million

**Award Announcement Date:** August 5, 2021

**Program Manager:** Amber Buckingham  
[iecgrants@iowaeda.com](mailto:iecgrants@iowaeda.com)  
515-348-6222

The Iowa Energy Center Grant Program's administrative rules can be found in Iowa Administrative Code section 261.404. You may also request a copy of the administrative rules by sending an email to [iecgrants@iowaeda.com](mailto:iecgrants@iowaeda.com).

### **Overview**

The Iowa Energy Center Grant Program provides grants to eligible applicants on a competitive basis. The program is funded by an assessment on the intrastate revenues of Iowa's gas and electric utilities.

The Iowa Economic Development Authority, in consultation with the Iowa Energy Center (IEC) Board, administers the IEC Grant Program. Administrative rules were adopted in early 2019 to the Iowa Administrative Code 261.404.

The IEC Board has a designated Grant Committee comprised of board members involved with review and recommendation of both pre-applications and applications. The IEC Board will make funding announcements at least once per fiscal year. Grants will be made by the Authority directly to Recipients, who will submit claims to the Authority on a reimbursement basis.

This guide provides the vision, policies, and administrative procedures for management of the Grant Program. This document will be reviewed and approved by the IEC Board at least once per year. *This guide does not replace administrative rules regarding the Grant Program. If a conflict between the two exists, the administrative rules will prevail.*

### **Purpose**

The IEC Competitive Grant Program is funded by Iowa utility ratepayers. Funds will be used for projects that aid in the implementation of the seven key focus areas of the Iowa Energy Plan and provide a benefit to the Iowa ratepayers. For the purposes of this program, a ratepayer is defined as a customer who pays for an electric or natural gas utility service in the State of Iowa.

- The seven key focus areas of the Iowa Energy Plan are:
  - Energy workforce development
  - Technology-based Energy R & D

- Biomass conversion
- Natural gas expansion in underserved areas
- Support for rural and underserved areas
- Electric grid modernization
- Alternative fuel vehicles.

### **Eligible Applicants**

Iowa Businesses, colleges and universities, and private nonprofit agencies and foundations are eligible to apply for IEC grant funds.

- Any eligible applicant may submit an application that includes one or more Sub-recipients.
- An eligible applicant may apply individually or jointly with another eligible or other eligible applicants.
- A principal investigator will be allowed to submit one application per funding announcement. An applicant who has applied as the principal investigator for a funding announcement may also be named as a co-investigator on additional applications submitted but may not be named as a principal investigator on additional applications.
- An applicant may apply jointly with ineligible applicants, but the applicant cannot act solely as a passthrough to the ineligible entity.
- A business will be considered an Iowa Business if the business is incorporated in the State of Iowa or authorized to do business in the State of Iowa.
  - A business that is authorized to do business in the State of Iowa must provide a certificate of authority during the full application phase.
  - Applicant must have an office physically located in Iowa.

### **Eligibility Requirements**

Requirements for IEC grant awards include but are not limited to the following:

- Applicants shall demonstrate a benefit for ratepayers.
- Applicants shall demonstrate that they are eligible candidates.
- Applicants shall demonstrate the capacity for grants administration
- Applicants who have previously received IEC awards shall have demonstrated acceptable past performance, including the timely expenditure of funds.
- Applications shall demonstrate the feasibility of completing the proposed activities with the funds requested.
- Applications shall identify and describe any other sources of funding for the proposed activities

### **Ineligible Projects**

The following projects are ineligible for funding:

- Relocation of a business
- Expansion of a business
- Funding for existing training programs
- Private asset development
  - Examples of private asset development include.
    - Installation of solar array on a building only to benefit the owners/occupants of that building.



- Research and Development used to primarily enable the manufacturing of a product solely for the profit of the applicant.
- Pipeline, transmission line, and distribution line construction
- First generation ethanol
- Cellulosic ethanol

### **Eligible Expenses**

Only expenditures directly related to the implementation of the funded grant activity will be reimbursed. Examples of eligible expenses include, but are not limited to:

- Salaries/Wages
- Supplies and Materials
- Domestic Travel
- Tuition
- Equipment purchases, which must be approved by the board at the time the award is made.
- Vehicle purchases, which are eligible only when the purchase of the vehicle is an integral part of the funded grant activity and must be approved by the board at the time the award is made

### **Ineligible Expenses**

Ineligible expenses include, but are not limited to:

- Purchase or rental of buildings
- Office equipment
- Furniture and fixtures
- Intangible assets
- International travel
- Insurance
- Phone expenses

### **Other Budgetary Requirements**

Other budget requirements include the following:

- Indirect costs shall not exceed more than 20 percent of the IEC award. This will be calculated based on the IEC award request.
- IEC grant funds shall not be used as cost share to a federal grant award.
- Vehicle purchases or other vehicle-related expenses are not eligible if the purchase or expense supports the proposed grant activity but is not an integral part of the proposed grant activity. If a vehicle purchase is an integral part of a grant activity but a Recipient fails to obtain board approval prior to the purchase, then the vehicle purchase is ineligible
- The final application budget must be within 5% of the budget identified in the pre-application, unless a more substantial deviation is requested by the grant committee.

### **Cost Share**

- Cost share is required to apply for Iowa Energy Grant Funds
  - Minimum cost-share 5%
    - In-kind donations can be used as cost share.

- Cost share for private industry applicants must include a monetary cost share contribution if supplies/materials or equipment are included in the budget (10% of these line items).
  - Example: Applicant includes the purchase/installation of batteries in their project budget under the equipment line item, at a cost of \$20,000. The total Iowa Energy Center award request is \$200,000. The applicant would be required to provide a total of \$10,000 in cost-share (5% of \$200,000), of which, \$2,000 must be a monetary cost share contribution (10% of the \$20,000 equipment line item).
- Applicants do have the opportunity to obtain extra points if they provide or secure additional cost share.
- Unrecovered indirect costs cannot be used as cost share.
- Cost share must be accounted for at the pre-application phase.
- Points awarded for cost share will be based on the total grant award request (5.1%-20.1%).

### **Application Process**

Pre-Applications and Applications will be available and accepted through IowaGrants.

- The IEC will review applications and make funding decisions after each funding announcement.
- Applications will only be accepted during the established application period, as identified at [www.iowaeda.com](http://www.iowaeda.com)
- Applicants planning to apply must create an IowaGrants account.
  - If the person completing the application already has an account through IowaGrants or a State of Iowa A&A account, this same account will be utilized.
  - If the person completing the application does not have an account, the applicant will need to allow a minimum of two weeks to register and activate their account.

### **Pre-Application Process**

- IEDA will release an open call for grants on their website and via email to stakeholders.
- Pre-application will be completed via IowaGrants.
- Once the pre-application window has closed, all pre-applications received will be reviewed by the program manager for eligibility and completeness. Internal IEDA staff will then review the pre-applications and prepare recommendations for the committee. Internal IEDA staff included in the review may include:
  - Grant Program Manager
  - Other Energy Office Program Managers
  - Team Leader
  - Legal Counsel
  - Financial Manager
  - Division Manager
  - Division Administrator
- The Grant Committee will then review the pre-applications and select which will move forward in the application process. The Grant Committee will evaluate and record the collective answers on a single review sheet with a numerical score and comments. The Grant Program Manager, on behalf of the Grant Committee, will invite selected applicants to submit a full application.
  - This invitation will be sent to the point of contact as provided in the pre-application.

**Pre-Application Review Criteria**

**Pre-Application Screening Criteria**

- Applicant is an eligible candidate
- Funding request meets eligible project and expense requirements
- Request is for no less than \$10,000 and no more than \$1,000,000
- Initial grant duration does not exceed three years
- Application is complete and submitted through IowaGrants
- Applicants must indicate if they have obtained cost share in the pre-application phase
- Principal Investigator/Applicant is not named as Principal Investigator/Applicant on any other applications. They can, however, be named as co-investigators or Sub-recipients on additional applications.
- Application approval document/certification has been signed and uploaded

**Pre-application Review Sheet**

Applicant must achieve a minimum score of 25 to move on to the full application round.

Evaluation Criteria	Total Points
Does the proposal demonstrate how the project meets one of the seven key focus areas of the Iowa Energy Plan?	7
Does the proposal demonstrate how the project provides a benefit to Iowa ratepayers?	7
Does the proposal clearly describe the project goals?	7
If the applicant has received previous IEC awards, did they demonstrate acceptable past performance?	2
Is the budget proposal complete and appear to support the grant activities as described?	3
Does the proposal describe a dissemination or post-grant activity plan?	3

Does the proposal demonstrate that the applicant has obtained cost share?	3
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**Full Application Process**

- The grant committee will invite selected applicants to submit a full application, which will be completed via IowaGrants. The program manager will communicate the application submission deadlines and other application details to selected applicants via the email address provided during the pre-application process. The program manager will be responsible for all communications to selected applicants and will serve as the point of contact for applicants.
- Once the submission deadline has closed, the program manager will review the applications for eligibility and completeness.
- Internal IEDA staff will then review the applications and prepare recommendations for the committee. Internal IEDA staff included in the review may include:
  - Grant Program Manager
  - Other Energy Office Program Managers
  - Team Leader
  - Legal Counsel
  - Financial Manager
  - Division Manager
  - Division Administrator
- An outside technical review panel may be utilized for application reviews when IEDA staff and/or Grant Committee members feel it is necessary. This may delay the published timeline.
- IEDA staff will prepare a recommendation for the Grant Committee. The Grant Committee will then review all of the applications and make a recommendation to the full board. The committee will score the applications together and provide one scoring sheet for each application.
- The Program Manager will summarize the applications and Grant Committee recommendations for the Board.
- The Board will then review all applications and the recommendations from the Grant Committee and vote on each application.
- Applicants selected to receive grant funds will be notified in writing within 15 days of the board’s decision. Applicants not selected will receive a denial letter.

**Review Criteria for Full Application**

**Full Application Screening Criteria**

Includes all of the pre-application requirements, plus:

- Indirect costs do not exceed 20% of the total award request
- Signature from the applicant organization’s **legally responsible official** on the **application approval document**, which will be uploaded to IowaGrants by the applicant.
- For projects where a co-investigator or Sub-recipient is named, a minimum of 51% of grant funds must be directed to activities performed by the Recipient organization.
- Application identifies any other sources of funding for proposed activities.

- Budget must be within 5% of the budget identified in the pre-application, unless a more substantial deviation is requested by the Grant Committee.
- If subrecipients or project partners are named in the application, a letter of support or commitment must be provided.

**Full Application Scoring Sheet**

Applicants must achieve a minimum score of 112 to be considered for funding.

Criteria	Evaluation Criteria	Total Points
Focus Area and Ratepayer Benefit	Does the proposal explain the benefit it will provide to Iowa ratepayers? Does the benefit appear to be sound and reasonable?	20
	Does the proposal meet at least one of the seven key focus areas? Does the fulfilment of the key focus area seem sound and reasonable?  Key Focus Areas:  Technology-based Energy Research and Development Natural Gas Expansion in Underserved Areas Support for Rural and Underserved Areas Energy Workforce Development Biomass Conversion Electric Grid Modernization Alternative Fuel Vehicles	15
Programmatic Capabilities	Does the proposal provide information regarding organizational experience, staff qualifications, and procedures and controls for ensuring that awarded grant funds will be used in a timely and efficient manner in order to successfully complete proposed activities?	5
	Has the applicant received previous Iowa Energy Center awards?  If no, applicant will receive up to 5pts.  If yes, did applicant expend grant funds in a timely manner and comply with reporting requirements? If yes, applicant will receive up to 5 pts.	5

Iowa Energy Center Grant Program Policies and Procedures – February 2021

Project Approach, Outcomes and Deliverables	Does the proposal describe the applicant's project goals to be reached by project end? Are the project goals described in clear, easy to understand language? Do the project goals appear reasonable?	20
	Does the proposal describe the timeline, project tasks and milestones of the project (in chronological order)? Do the project goals appear reasonable?	10
	Does the proposal define the qualitative and/or quantitative measures the applicant will use to document the achievement of the goals of the project? Do the measures appear to be reasonable?	10
	Does the proposal satisfy a need or a problem?	5
	Does the proposal demonstrate a creative approach to a need or a problem?	5
	Does the proposal define the staff roles and responsibilities in the scope of work?	5
Budget and Budget Narrative	Does the proposal demonstrate that the project is feasible within the resources requested?	10
	Is the budget narrative complete, reasonable, and sound?	10
Dissemination and Replication	Does the proposal provide a clear dissemination or post-grant plan?	5
	Does proposal demonstrate that the benefits of the project can be replicated by outside entities post grant completion?	10
Cost Share	Does the proposal indicate that the project has received either cost share funding match or external funding? This score will be calculated based on the total project budget. 5 1% - 10% - 2 pts 10.1 - 15% - 5 pts 15.1 - 20% - 10 pts 20.1% + - 15pts	15
	Does the proposal demonstrate they are collaborating with other organizations?	5

Collaboration	Does the proposal demonstrate they are collaborating with another eligible applicant?	5
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**Administration**

**Agreement**

The Authority will notify successful applicants in writing of an approved request for funding IEDA will, at the same time, issue an agreement, which will be between the Recipient and the Authority. The Recipient must return the agreement to the Authority within 45 days of the transmittal of the agreement from the Authority. Failure to return the agreement may be cause for the Board to terminate the award.

**Amendments**

Any substantive change to a funded IEC project, including time extensions, budget revisions, and alterations to proposed activities, will be considered an agreement amendment. The Recipient shall request an amendment in writing. No amendment will be valid until approved by the Board, except the following (with written confirmation from the Authority):

- Staff may approve one no-cost extension provided that the extension does not cause the duration of the grant to exceed five years. Additional no-cost extensions will require Board approval.
  - A typical no-cost extension will not exceed one year.
  - A no-cost extension request must be submitted at least 45 days prior to project end date as listed in the agreement.
- Staff may approve budget modifications that are not substantial. For purposes of this program, “substantial modification” means a budget modification of either \$10,000 or 10 percent of the total grant award, whichever is less.

To request a contract amendment (include all rebudget requests and revisions), the Recipient shall initiate the amendment process in writing, preferably through IowaGrants. If the Recipient organization has a sponsored programs office, the amendment request must be approved by the appropriate legally responsible official. Once the amendment request is received, staff will review and determine if the request requires Board approval. If it does, staff will place the amendment request on the agenda for the next scheduled Board meeting. If staff determines the request can be approved without Board approval, staff shall initiate the amendment approval process.

**Disbursement of Funds/Claims**

- Disbursements will be made on a reimbursement basis. No advance disbursements will be allowed. Disbursement claims must be for an amount equal to or greater than \$500 per request, except for the final draw of funds. All claims must be made through IowaGrants.gov and must be submitted monthly. When submitting a claim, the following items will be required:
  - An invoice on the submitting organization’s letterhead as well as:
    - A detailed description of the expenditures and their corresponding amounts.
    - Product invoices and proof of payment for any equipment, supplies or materials purchased.
    - Receipts for any domestic travel expenses.
    - Invoices and proof of payment for any subcontractor payments.

- Invoices and proof of payment for any co-investigator payments.
  - The Authority may request additional documentation as needed.
  - A General Account Expenditures (GAX) Form with a Vendor Code.
  - A status report for the claim period. Status reports must be received once a month. If no funds are requested, Recipients should still file a status report via IowaGrants.
- Final claim must be received within 120 days of project completion as defined in the project agreement.
  - The Authority will withhold 5% of award funds until the final report is received and approved by the Program Manager.
- Any funds not claimed within 120 days of project completion will be considered deobligated

## Status Report Requirements

### Recipient Reports

#### *Monthly Status Reports*

- In the final application, the applicant shall provide a timeline and the goals and objectives by which to measure the success of the project. The timeline should provide the start date (by month) and end date (by month) of each goal/objective. The Recipients' success will be measured based on the progress towards the completion of each goal or objective as outlined in the final application timeline.
- By the 15<sup>th</sup> day of each month, the Recipient must provide an update on the percentage towards completion of each goal or objective and a narrative of the activities that have taken place in support of the goal or objective. This should be in table format and include information for each individual goal or objective, as well as a narrative for each goal or objective.
  - If the monthly report has not been received by the 30<sup>th</sup> day of the month, the grant will be considered out of compliance.
- Recipients shall also provide a narrative description of any deviations from the proposed timeline, tasks, and objectives during the reporting period. If the reported deviations will have an impact on the remainder of the project or the dissemination plan, the Recipient also notify the program manager via email.

#### *Final Report*

- The final report will be submitted via IowaGrants within 120 days of the project completion date.
- The Authority will withhold 5% of award funds until the final report is received and approved by the program manager.
- The final report shall contain the following information:
  - Executive summary
  - Timeline of the completion of each goal or objective
  - Narrative description of grant activities undertaken to support the project
  - Narrative description of the achievements of the project
  - The benefit the end product provides or will provide to Iowa ratepayers
  - Budget narrative, detailing how funds were spent in support of the project
  - Narrative description of any deviation from the original budget, timeline, or any grant activities



- Dissemination plan/post grant activities timeline Please include any deviations to originally proposed dissemination plan.
  - Examples may include, but are not limited to:
    - Conference presentations
    - Speaking engagements
    - Publishing white papers

### **Staff Reports**

#### *Quarterly and Annual Reports*

- Quarterly and Annual reports will be comprised of the prior 3 or 12 months of monthly status reports. Recipients will not need to submit additional reports.

### **Monitoring**

IEDA will use the following process to monitor the IEC grant activities:

#### *Desktop monitoring*

- IEDA will review the claims and status reports in IowaGrants.
- IEDA will review the progress of the project through monthly status reports uploaded to IowaGrants by the Recipient.
- IEDA will review timely expenditure of funds by the Recipient through monthly claims via IowaGrants.
- IEDA will identify performance and expenditure issues and will contact the Recipient to address any concerns over either.
- If the program manager feels that milestones are not being met, the program manager will contact the Recipient and attempt to obtain a written explanation.
- IEDA will notify the grant committee and/or IEC board of any ongoing performance and/or reporting issues.

#### *Onsite Monitoring*

- IEDA staff will routinely complete one site visit per year. Staff retains the right to increase the number of site visits if necessary.
- The IEDA project manager will notify the Recipient at least three days in advance of a site visit.
- IEDA staff will complete monitoring visit information in IowaGrants.
- If any additional information is requested during the site visit, the Recipient will upload that information into IowaGrants.

### **Closeout Procedures**

- Final report will be submitted by grant Recipient within 120 days of project completion via IowaGrants.
- Final payment will be made after the program manager has determined milestones have been met and project goals have been completed.
- IEDA will provide a final closeout document stating that contracted funds have been spent in accordance with the agreement and the agreed upon deliverables have been achieved

- If a balance remains after the final claim has been received and payment has been made, the unused funds shall be deobligated.

**Noncompliance**

At any time during the project, the IEC may, for cause, find that a Recipient is not in compliance with the requirements of the program. At the Board’s discretion, remedies may include penalties up to and including the return of grant funds to the IEC. Noncompliance may include, but are not limited to the following:

- Use of IEC funds for activities not described in the application.
- Failure to complete approved activities in a timely manner.
- Failure to comply with any applicable state or federal rules, regulations, or laws.
- Lack of a continuing capacity of the Recipient to carry out the approved project in a timely manner.

# ATTACHMENT D

ACTION
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**REPORT**  
**IOWA ENERGY CENTER BOARD**  
**FEBRUARY 2021**

From: Energy Office

Subject: Recission of Grant Award – Building Enclosure Council of Iowa

**Background:** The Iowa Energy Center (IEC) Board approved a grant award for the Building Enclosure Council of Iowa (‘Recipient’) on September 17, 2020 in the amount of \$10,575. Upon receipt of the award letter, the Recipient realized that the budget in the application was incorrect and would not provide sufficient funds to complete the deliverables as outlined in the application.

Following internal discussion and feedback from the Grant Committee, the Recipient agreed to the recission of their grant award and intends to submit a new pre-application during the upcoming grant cycle.

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<b>Proposed Motion:</b>	<b>Approve the recission of the grant award made on September 17, 2020 to the Building Enclosure Council of Iowa.</b>
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Submitted By: Amber Buckingham

Attachments: Recipient request



February 5, 2021

IEC Board & IEDA Staff  
1963 Bell Avenue, Suite 200  
Des Moines, Iowa 50315

SUBJECT: Change to Iowa Energy Center Competitive Program Grant 365939

To the IEC Board,

On behalf of the Building Enclosure Council of Iowa, I would like to discuss the grant award for our project titled "Building Enclosure Council of Iowa Educational Programs." After review of the agreement and discussing the expectations of the Iowa Economic Development Authority staff, we would like to request our grant award be rescinded and BEC-Iowa will resubmit for the 2021 award program. Our reason for this is that we misunderstood the timeline, and thought the \$10,575 was for one year, rather than being spread over a three-year period. Our intent was to provide a multi-day, multi-path event with national speakers, however with the limited award amount we do not have the budget to provide these types of large-scale, high-cost events.

Thank you for understanding our situation and the Building Enclosure Council of Iowa looks forward to providing high-quality educational training in Iowa that is greatly needed. Do not hesitate to contact me if you have any questions.

Sincerely,

A handwritten signature in black ink, reading 'Janna Alampi', written over a horizontal line.

Janna Alampi, AIA, NCARB, BECxP, CxA+BE  
Past Chair

## ATTACHMENT E

# Iowa Wastewater and Waste-to-Energy Research Program

SCIENCE AND SERVICE:

ROBUST, AFFORDABLE, AND PROFITABLE SOLUTIONS FOR IOWANS

### **Dr. Craig Just**

*Associate Professor, Civil & Environmental Engineering*

University of Iowa, [craig-just@uiowa.edu](mailto:craig-just@uiowa.edu)

IEC Board Meeting, February 11<sup>th</sup>, 2021

**IOWA**

**College of Engineering**  
Wastewater and Waste to Energy  
Research Program



**The IWWERP is a public-private partnership for innovation, data generation, and resource allocation. For example:**

**< \$2M Iowa company  
Founded 2020**



- **Fierce focus on rural Iowa wastewater problems**
- **Intriguing business model that overcomes bonding authority issues for small towns**
- **BES needs UI technical assistance to grow efficiently and rapidly**
- **UI sensor network already deployed to monitor one rural installation**
- **UI provides the data needed for IDNR consideration**

**< \$10M Iowa company  
Founded 2014**



- **Successfully incubated by ISU, IEDA, etc.**
- **Barriers for rural wastewater installations remain**
- **Emerging opportunities for larger wastewater facilities must be explored**
- **Fierce competition from CLEARUS (supported by U of Illinois) for Dept. of Energy development dollars, etc.**
- **UI can provide data needed for IDNR consideration of new process applications**

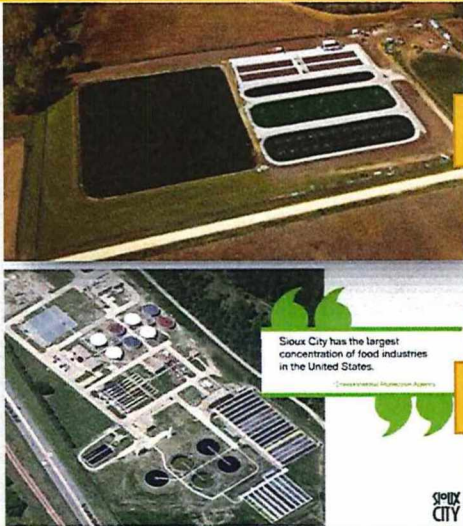
**\$5B global company with an  
“underserved markets” initiative**



- **Dr. Just has a development agreement with Xylem focused on underserved markets in rural settings**
- **Xylem has the sensors to support the “water ambulance” response service that rural Iowa needs**
- **UI cloud computing expertise is leveraged by Xylem’s Hydrosphere data platform**
- **Xylem supports the energy efficiency needs of our larger wastewater systems (municipal and industrial)**

# The IWWERP will address challenges through practical actions

Primary



Secondary



## Challenges

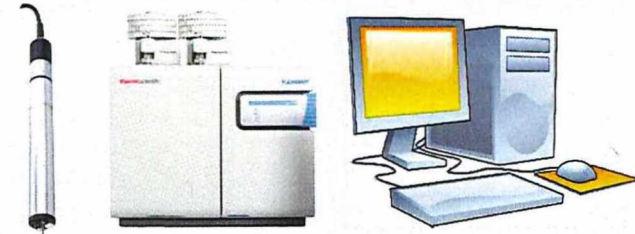
- Lagoon sludge
- Aeration efficiency
- Cold weather ammonia
- Disinfection
- Nutrient reduction
- High strength organics
- Fats, oils, and grease
- Municipal treatment capacity & efficiency
- Anaerobic digestion capacity
- Manure runoff
- Biosolids toxicity
- Energy intensity
- Profitability
- Nutrient runoff
- Soil health
- Rivers and streams
- Groundwater contamination

## Actions

**IEDA SIP**

### Diagnostics

Field deployments, lab analyses, modeling



### Applied Research



**IEDA Energy**

### Technical Assistance

Consultants, businesses, industries, cities, farmers, IDNR, third party evaluations

### Grants & Partnerships

Private \$\$\$, cooperative agreements, federal, joint IP, business development



College of Engineering  
Wastewater and Waste to Energy  
Research Program



# The IWWERP Innovation Center and Tech Park will leverage the municipal water resource recovery facility in Iowa City



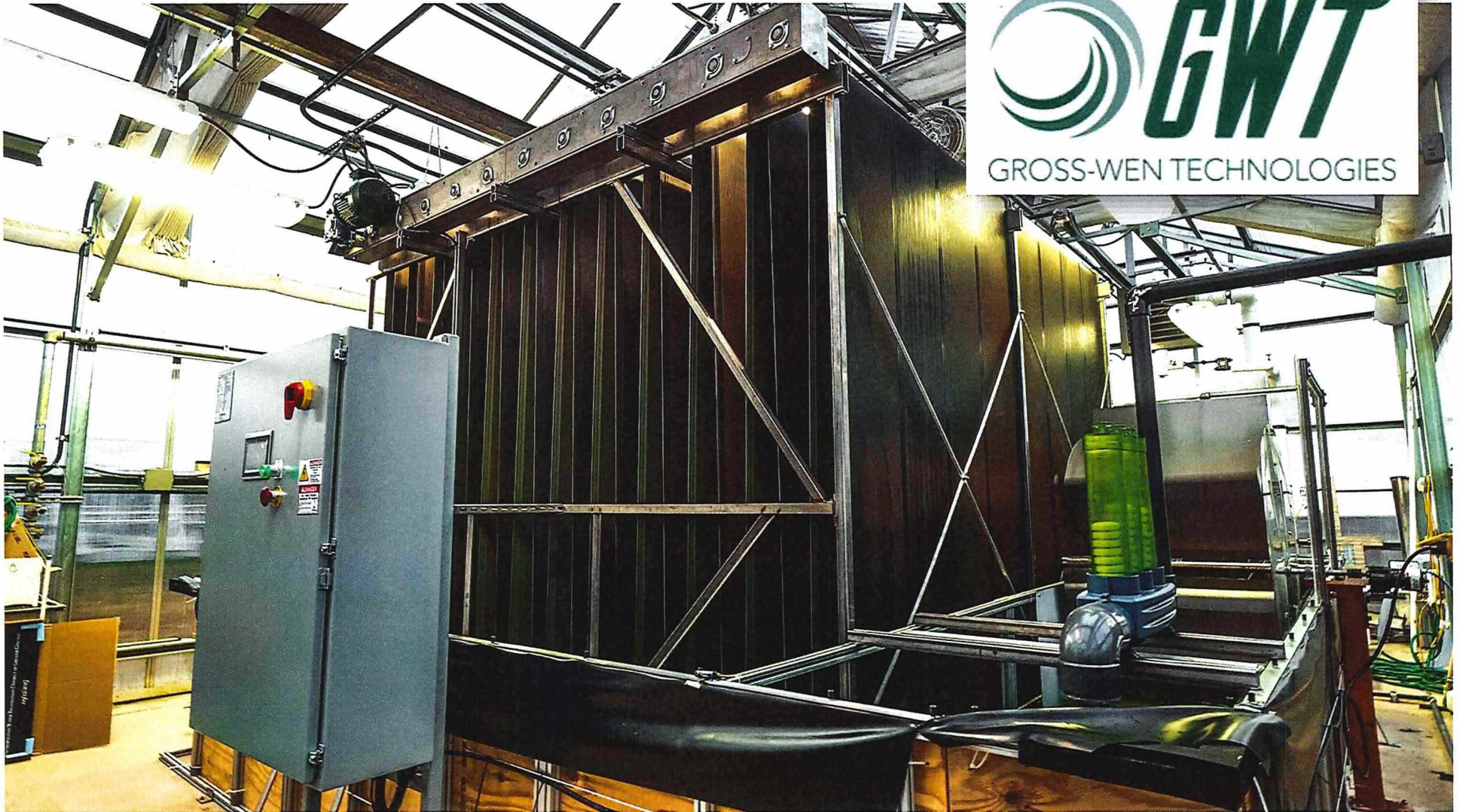
**IOWA**

College of Engineering  
Wastewater and Waste to Energy  
Research Program





In 2021, the IWWERP Innovation Center and Tech Park will feature a full-scale greenhouse for algae research



**IOWA**

College of Engineering  
Wastewater and Waste to Energy  
Research Program

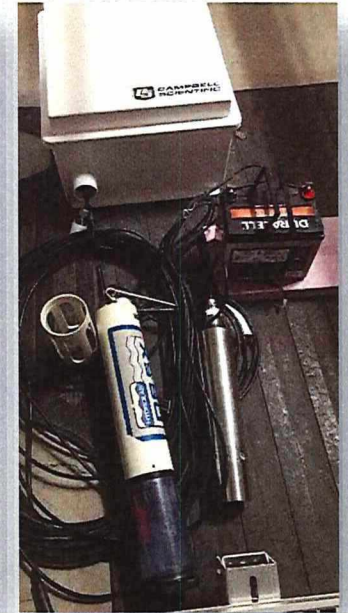
<https://algae.com/>



In 2021, the IWWERP Innovation Center and Tech Park will feature a full-scale moving bed biofilm reactor (MBBR) that targets small town ammonia treatment



# University of Iowa resources provide unique value through the IWWERP



College of Engineering  
Wastewater and Waste to Energy  
Research Program



IWWERP capacity has already been leveraged for a DOE proposal

FY21 Bioenergy Technologies Office (BETO)  
Feedstock Technologies and Algae FOA  
FOA: DE-FOA-0002423  
Concept Paper

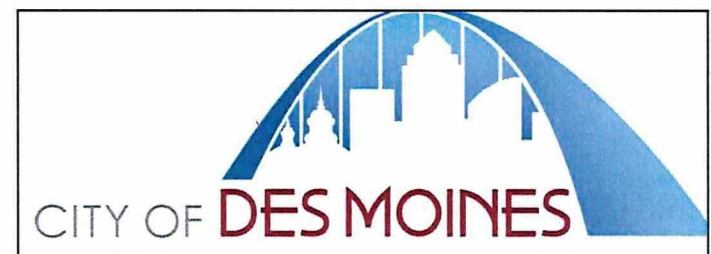
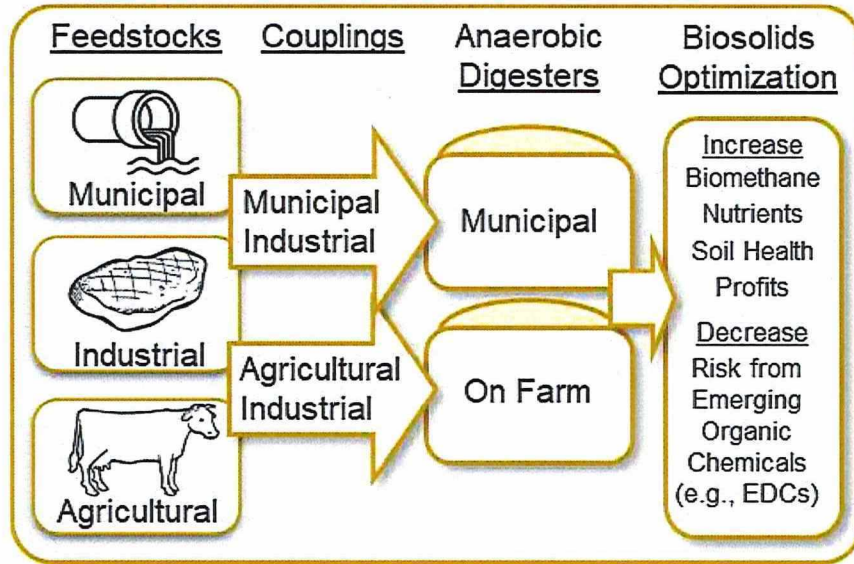
*Revolving Algae Biofilm Strain Development*

Topic Area 2: Algae Productivity Exceeding Expectations  
Subtopic 2b: Improvements in Productivity with Direct Air Capture  
of CO<sub>2</sub> from Ambient Air



**IWWERP capacity has already been leveraged for a \$1.5M EPA proposal**

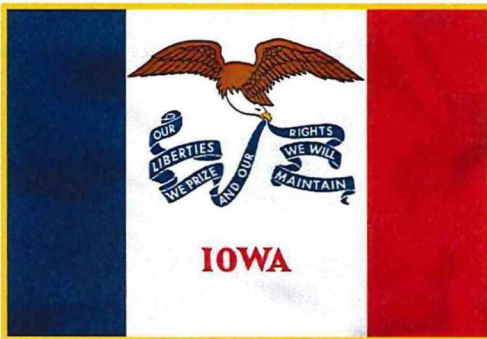
**Occurrence and Fate of Endocrine Disrupting Chemicals in Biosolids from Anaerobic Digestion of Mixed Waste Streams**



## IWWERP has many energy-related capacities and ambitions



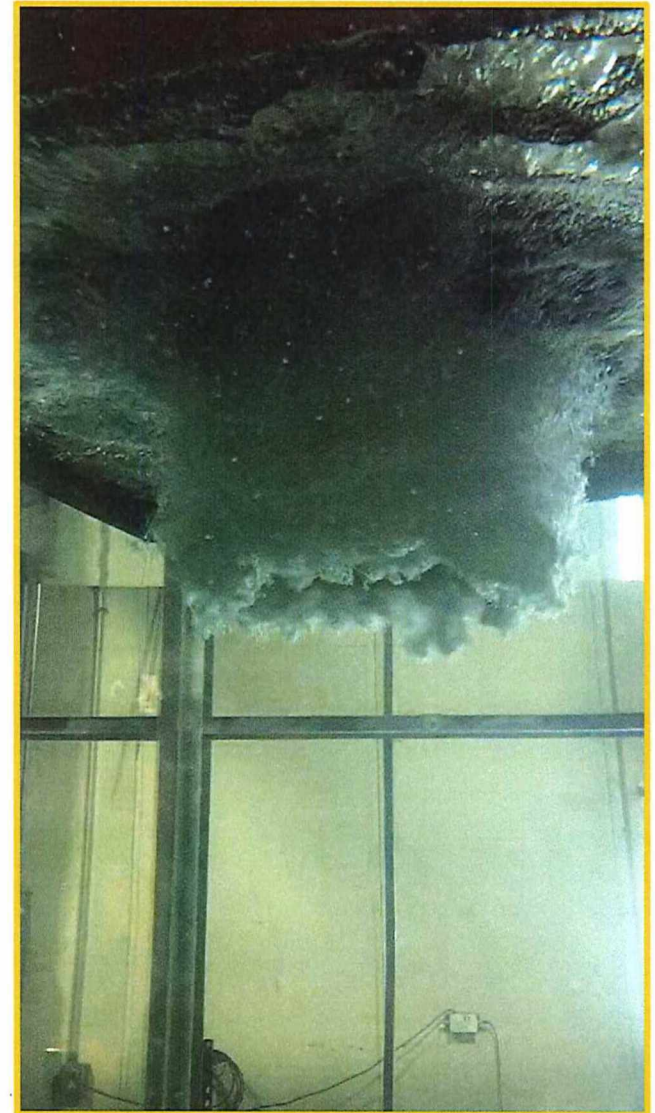
- Whole plant energy audits and “digital twins”
- Mixing & aeration efficiency improvements
- Large and small facilities



- Statewide aeration audits and process control for energy savings
- Statewide improvements toward the Iowa Nutrient Reduction Strategy



- Federal projects to expand state capacity
- Waste-to-energy projects and markets



**Thank you!**

# **Iowa Wastewater and Waste-to-Energy Research Program**

SCIENCE AND SERVICE:  
ROBUST, AFFORDABLE, AND PROFITABLE SOLUTIONS FOR IOWANS

**IOWA**

**College of Engineering**  
Wastewater and Waste to Energy  
Research Program



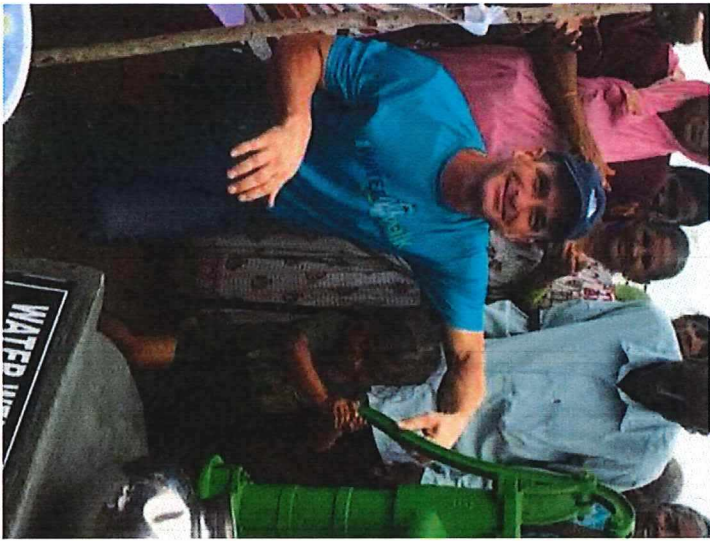
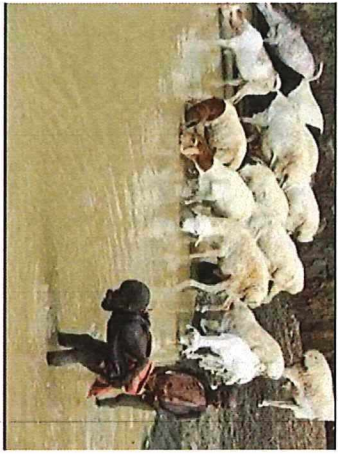
ATTACHMENT F



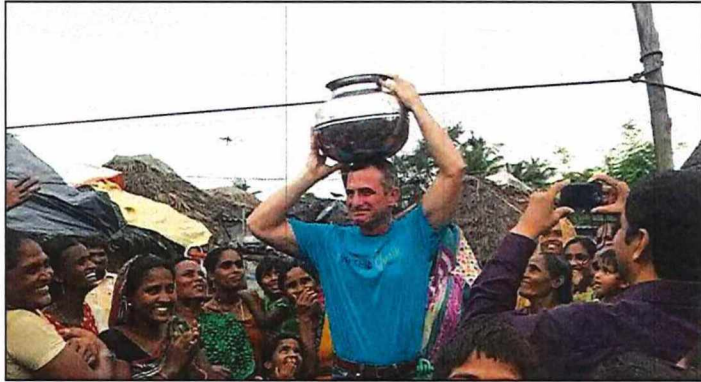


**Can Small Equal Big?**

# The Start



## The BES Water Solutions Team



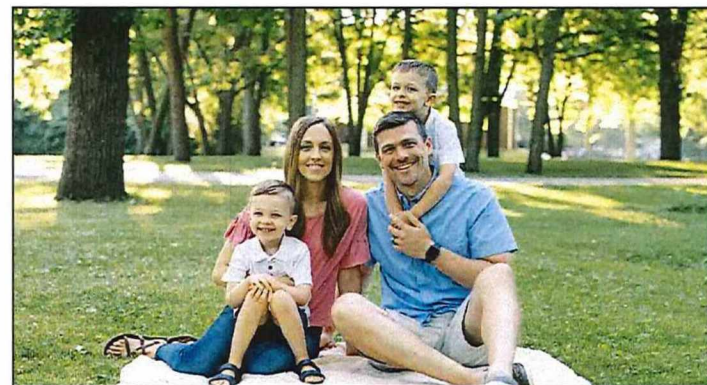
Todd Baldrige



Randy Seberg

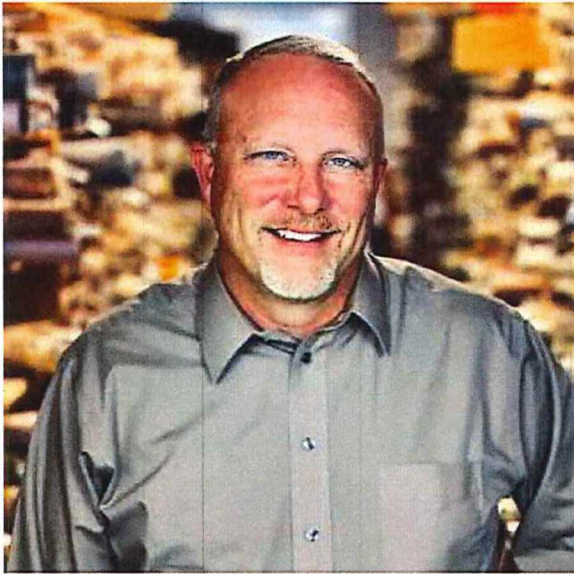


Matt Mowery



Nathan Seberg

## Engineering Partnership



Bob Venvertloh

Chief Engineer, Mechanical &  
Electrical Department Director

- 28 Years with Klingner & Associates
- Department Director 19 years
- Connected to BES 10 plus years



Mark Bross

Chief Engineer, Water/Wastewater  
Department Manager

- 25 Years with Klingner & Associates
- Department Manager 5 years
- Lead at Middletown

## Academic Partnership



**Dr. Craig Just**

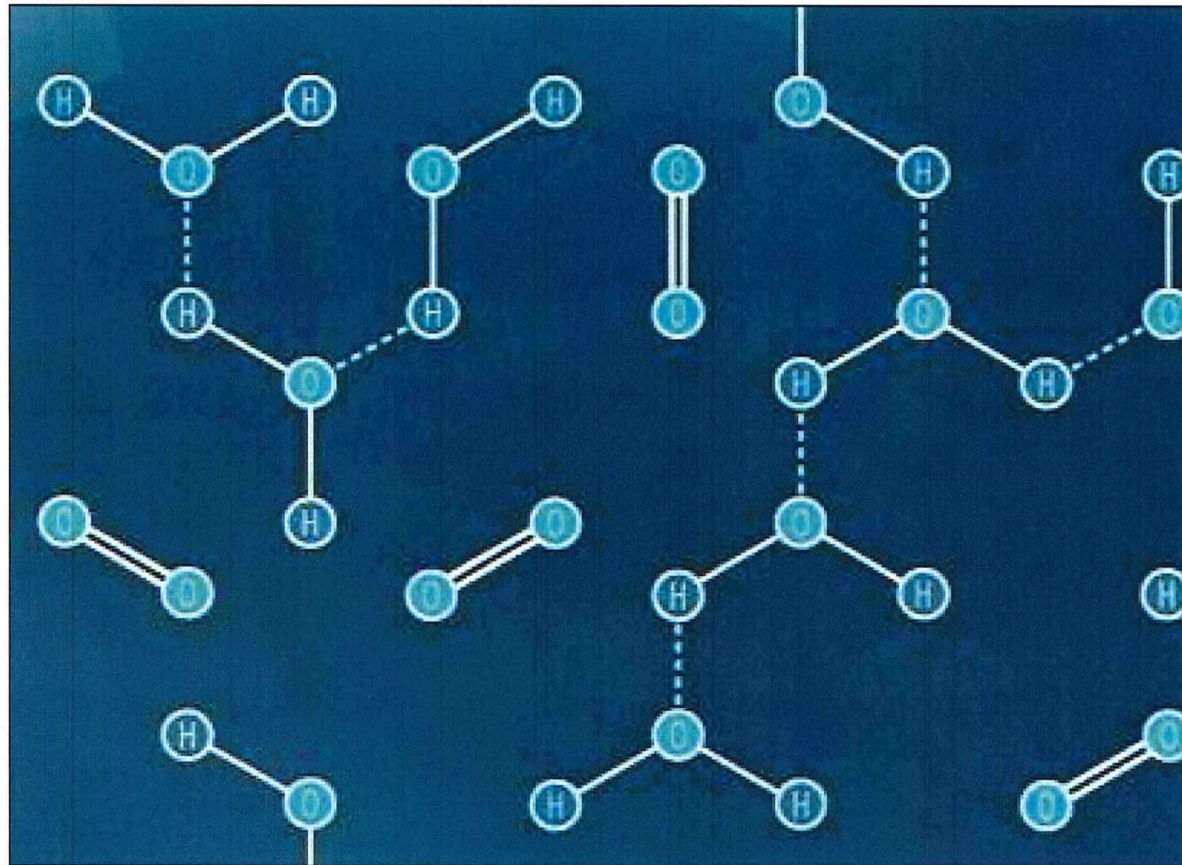
**University of Iowa**

- Associate Professor, Civil and Environmental Engineering
- Assistant Faculty Research Engineer, IIHR – Hydrosience & Engineering



**What Is BES Water Solutions?**

## A Specialized Dissolved Oxygen Company



**How Are We Different?**

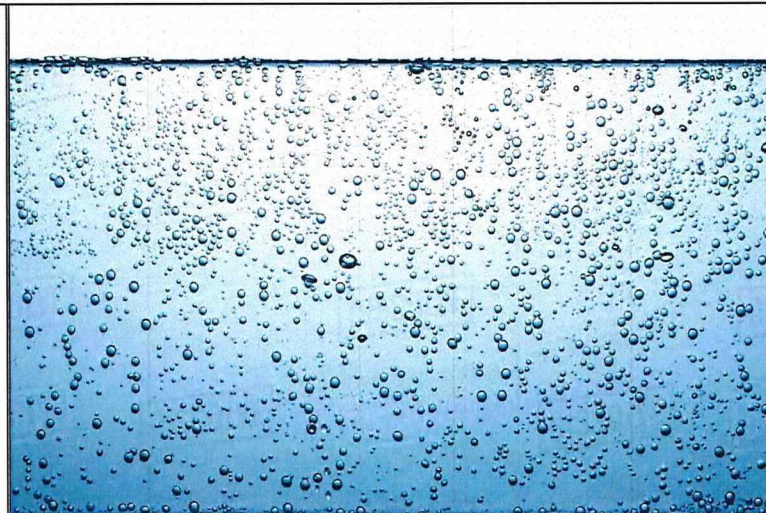


## The Power and Efficiency of a Bubble

The Basketball

The Everyday Bubble

The Nanobubble



435 Cubic Inches

278 Total Square Inches

(16in x 16in square)

212,995 bubbles to equal the  
basketball's volume

16,578 - Total Square Inches

(10 ft x 10ft square)

871,231,318,338,457,000  
bubbles to equal the basketball's volume

265,124,628 - Total Square Inches

(6,868,800)

# Results

## Grant Sites

### Birmingham

Electrical Efficiency

Current Setup:

Two 10 hp air pumps (Single Run Times)

25 Amp Average Electrical Draw

New Technology Test:

Two 2 hp Micro Bubble Diffusers

11.5 Amps Electrical Draw

\*\*\*

30-45% Reduction in Electrical Draw

### Wayland

IDNR Lagoon Effluent Compliance

Seeking increased efficiency in the treatment of BOD (Biological Oxygen Demand) and ammonia reduction.

Complimentary lagoon treatment at five horsepower of energy use.

\*\*\*

Ammonia Concentration Limits –  
16 mg/L allowed vs  
4.69 mg/L released

Ammonia Pound Limits –  
41.1 pounds allowed vs  
5.81 pounds released

### West Branch

Sludge Reduction Efficiency

Primary Cell:

6% Reduction in Total Gallons of Sludge  
66% Reduction in Pounds of Volatile Sludge

Secondary Cell:

30% Reduction in Total Gallons of Sludge  
54% Reduction in Pounds of Volatile Sludge

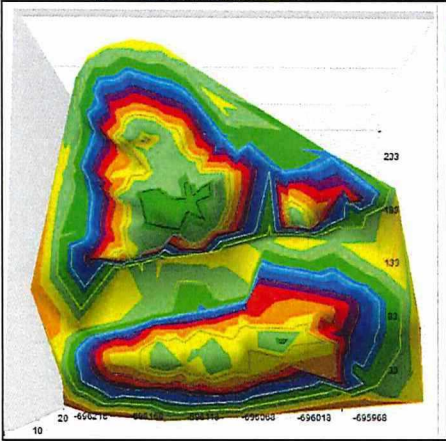
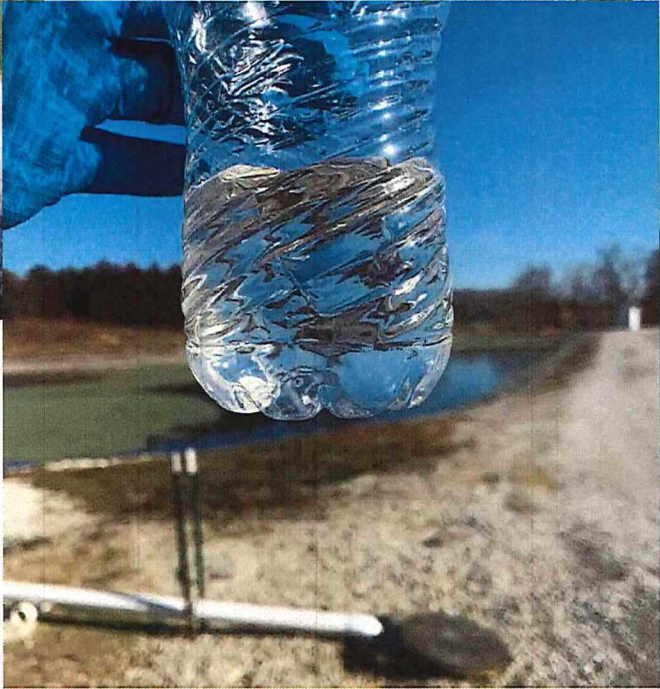
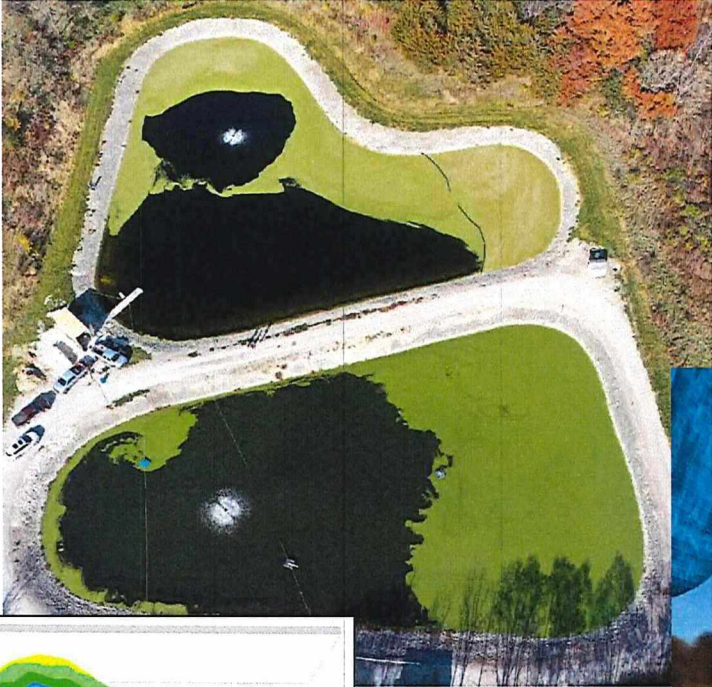
Five horsepower energy use, plus enzymes

\*\*\*

Cost to community: \$45,000  
(Community estimated \$250,000  
for lagoon dredging)

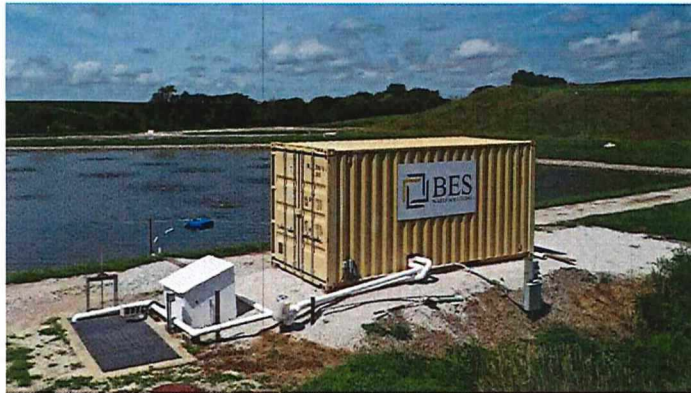
# Middletown

Project Start: May

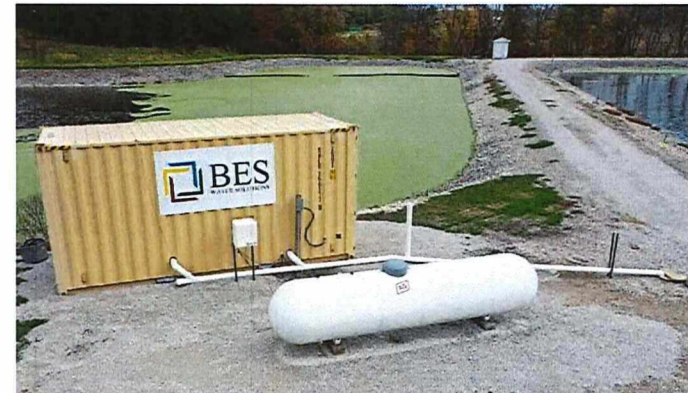


# The BES Setup

## On Site Equipment



Dissolved Oxygen Machine (DOM)



Moving Bed Biofilm Reactor (MBBR)



Mobile DOM



Bacteria and Enzymes

### Bacteria:

- *Pediococcus Acidilactici*
- *Leuconostoc Mesenteroides*
- *Bacillus Amyloliquefaciens*

### Yeast/Enzymes

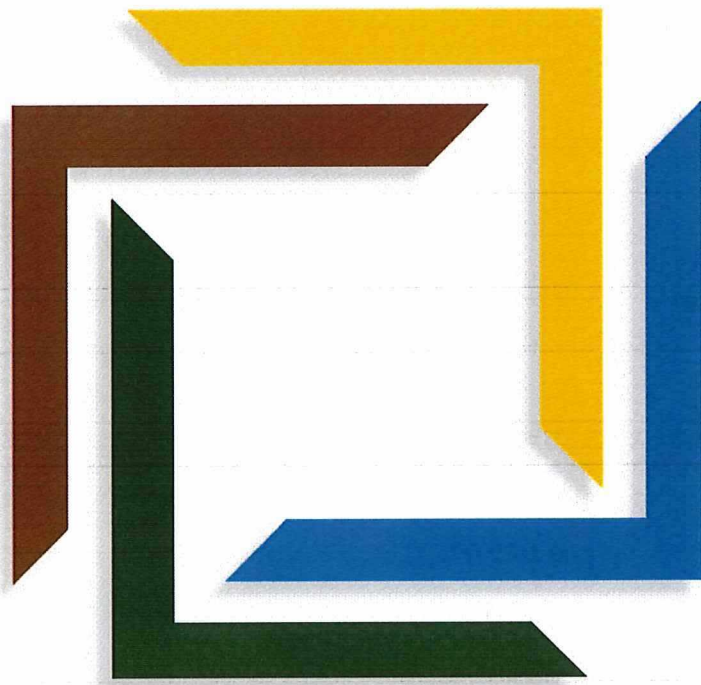
- *Pichia Farinosa*
  - Produce Killer Toxins
- *Dekkera Anomala*
  - Produces Enzymes: Cellulose, Hemicellulose, Xylanase, Cellubioase, Amylase, Pectinase, Lignase and Arabinase

## Realization of Costs

	Upfront Cost	Monthly Subscription	Maintenance	20 Year Total
<b><i>Norway</i></b>	\$2,285,000	NA	?	\$2,285,000+
* NitrOx Solution advertised as 2/3 cost of competition.				
<b><i>New Virginia</i></b>	\$3,100,000	NA	?	\$3,100,000+
* Proposed installation site for a SAGR system.				
<b><i>BES Water Solutions</i></b>	\$62,000	\$3,000	None	\$746,000
* Projected Full System Cost including DOM, MBBR and Enzymes.				

**Can Small Equal Big?**





# ATTACHMENT G



Iowa Energy Office  
American Recovery &  
Reinvestment Act (ARRA)

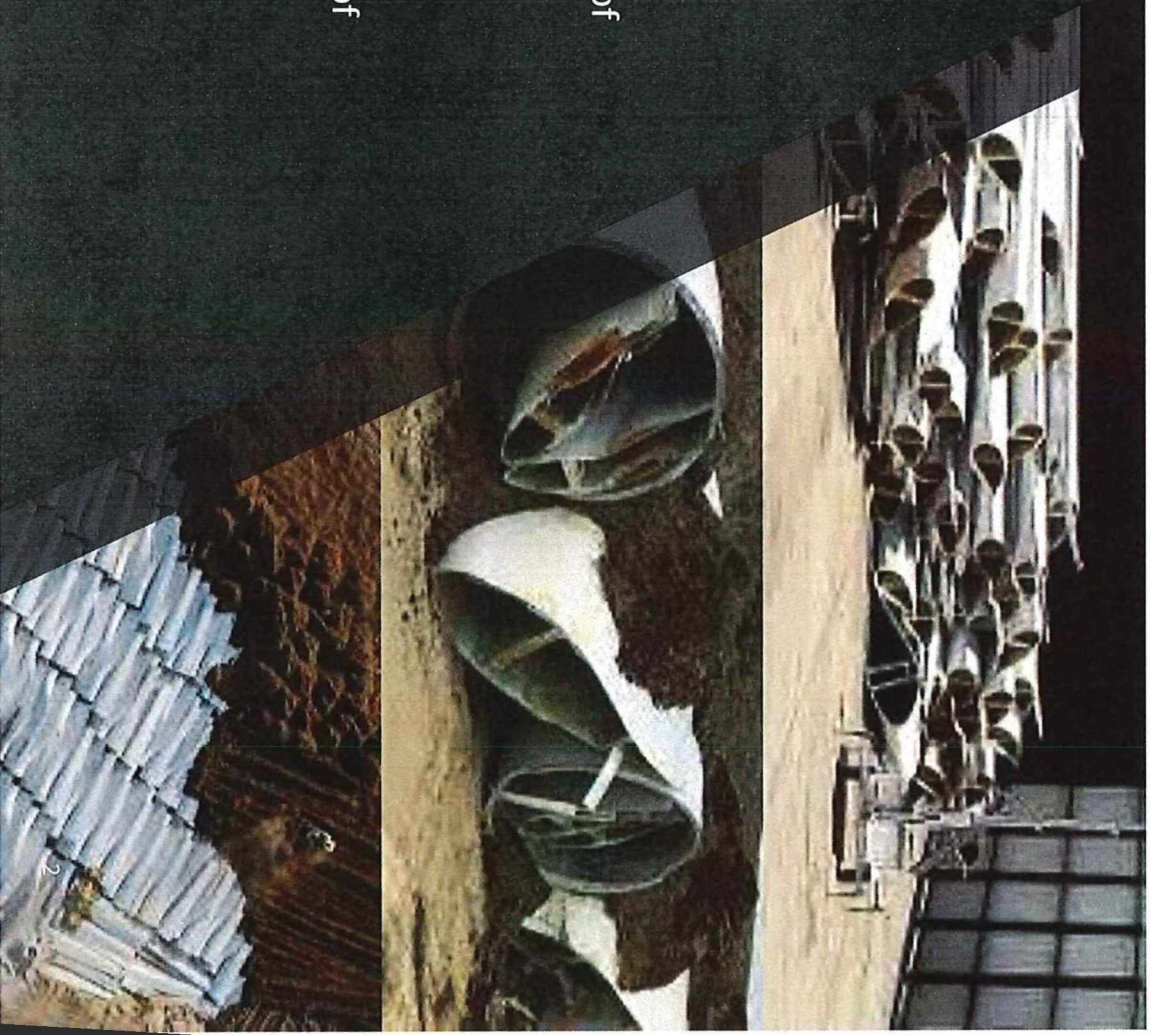
A Comprehensive Study – Opportunities to  
Energy Efficiently Collect, Transport, Process  
and Repurpose End of Life (Obsolete) Wind  
Energy Turbine Blades

# Wind Turbine Blade End of Life

There are concerns about the end of life of existing wind turbine infrastructure

As these wind turbine blades become obsolete, the state of Iowa will need to determine effective strategies to collect, haul and repurpose these blades so they do not end up in municipal solid waste landfills

This effort is integral to the continued long-term viability of Iowa's wind energy economy to ensure that these wind turbine blades are beneficially recycled



# Project Team

Project team consists of J. Pettiecord Inc, Mid America Recycling and Polymer Crete LLC to explore a way to efficiently recycle wind turbine blades into viable commercial products

J. Pettiecord Inc. is one of the leading specialty contractors in the Midwest. Pettiecord's heavy haul trucking operations provide critical and integral support for leading Iowa wind farm developers and contractors. Company specifically provides trucks and trailers to haul heavy equipment and supplies for leading wind energy developers to include MA Mortenson and Blattner Energy

Mid America Recycling provides both large and small companies with a complete portfolio of recycling services and end markets in North America. Mid America Recycling is the largest recycling facility in Iowa and offers both residential and commercial single stream processing capabilities. The Des Moines operation includes a multi-material recycling plant, glass processing facility, equipment development and manufacturing shop, and secure multi-media destruction services. The facility provides services to customers throughout Iowa, Illinois, Minnesota and Missouri

Polymer Crete, Inc. is a materials technology design and development company focused on innovative Polymer concrete and fiberglass reinforced polymer products. Polymer Crete has existing relationships with material processing companies in the United States which are already processing recycled fiberglass into commercial grade products and Polymer Crete has successfully used recycled materials substituted for fillers and reinforcements within their mix designs and composites

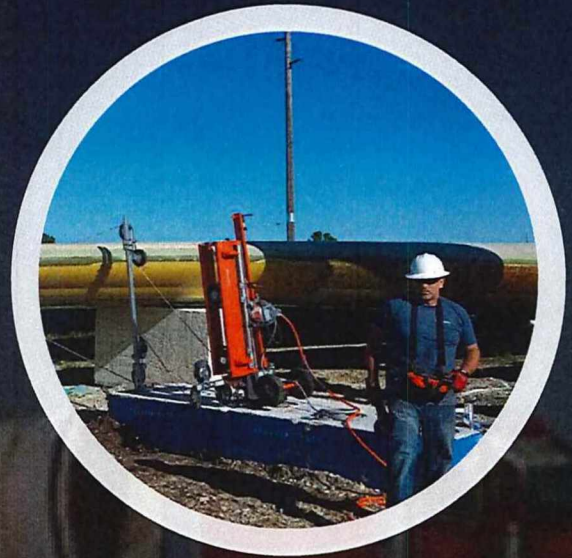
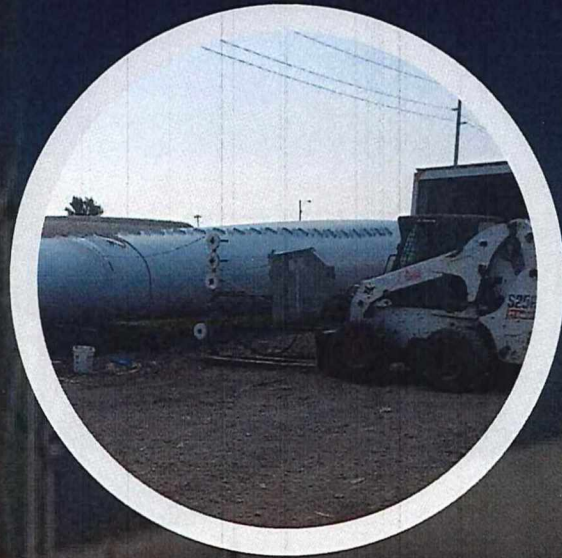
# Project Scope

Process will include cutting the blades to haulable lengths and removal from wind farm, Shredding the cut blades into a small chip (4" X 6") and then process these cut chips into a usable fiber product

Processing will utilize a combination of hammer mills, granulators, to free the fiber into uniform lengths from 3" down to a milled powder 10 microns up to 1/32-inch milling

Companies have processed various recycled fiberglass (boats, tub surrounds, auto parts,...) into commercial grade fiber and fillers and Polymer Crete LLC has successfully used recycled materials substituted for fillers and reinforcements within their mix designs and composites

These recycled composite materials can be used as fillers and reinforcements to manufacture products that the Wind Energy Industry currently use creating a [upcycle closed loop system](#)



On-site cutting and Transporting

Collect and transport obsolete wind energy turbine blades for processing trials

Task 1 & 2

## Task 1 & 2

### On-site Cutting of the wind turbine blades

Cutting equipment that trials were performed with and evaluated

Diamond Wire Saw used in the quarry industry

- both fixed and mobile
- Mobile set-up cut through the blade section within 10 minutes

High pressure dry ice jet

- Virtually no affect on blade surface / did not cut

High pressure water jet

- Cut but, extremely time consuming / not a good option

Hydraulic circular diamond circular saw

- Attached to an excavator
- Used in Europe for efficiency and speed of cutting
- Technology from the forestry and quarry industries

# Findings

## Cutting

In order to efficiently transport and shred the blade multiple cutting methods were evaluated to maximum sectioned lengths  
The best approach was a wire saw attached to a skid loader making the saw mobile

Using this method an entire blade, if staged properly and free of obstacles could be cut within an hour

## Transporting

Blades cut to sections lengths matching the trailer length

Blades are then hauled from the wind tower site to a staging location where they can be shredded and readied for processing

## Shredding

Numerous types of shredders are available in a multitude of industries, our trials were conducted with a top feeding, low speed, high torque shredder

Shredder used in our tests was manufactured for use in the forestry industry, primarily used to generate mulch

Shredder was equipped with various screen sizes.

Different screen sizes were tested to determine which size produced the best feedstock

The best solution allowed for approximately 4-to-6-inch chips

The feedstock was then dumped directly into roll off containers and ready to transport for processing





Conduct trials to determine optimal processes and equipment to take the cut blade and shred into small chip size

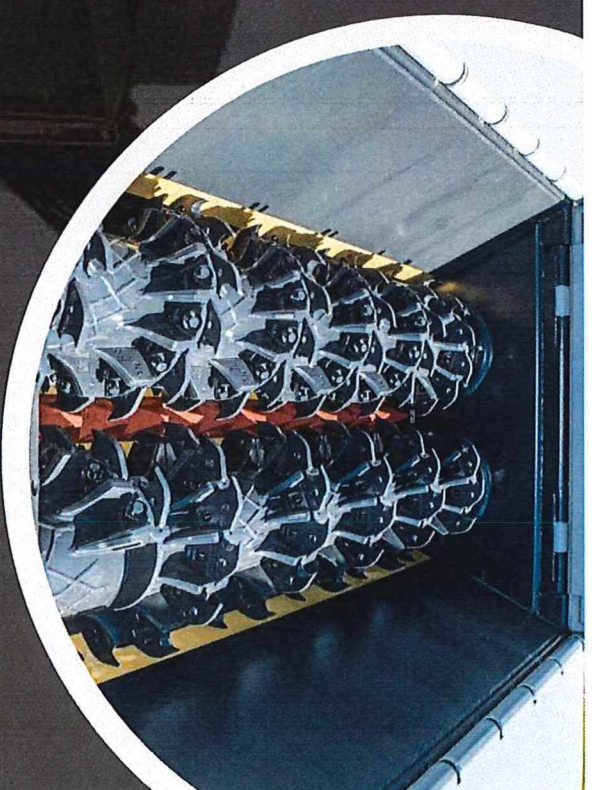
## Task 2

# Task 2

## Primary shredder

- Low-speed, high-torque, dual shaft industrial shredder
- Adjustable screen baskets to create output sizes from 2" to 24"
- Large top load area for quick feed

Note: Ran trials with different screen baskets to create the desired chip sizing for processing



# Task 2

## FINDINGS

High-speed / high torque shredder

### PRO

Produced great looking fiber strand – lengths of up to 24”

Potentially could produce a better feed stock to process

### CON

Worked but the equipment broke at both demonstrations due to the hard nature of the fiberglass.

Fiberglass also got very hot – We believe if this type of equipment is running constant there will be a fire within the grinding chamber.

In-put / in-feed diameter is small at 4’ X 3’ so the blade needs to be cut down even more that a top feed

Low-speed / high torque shredder

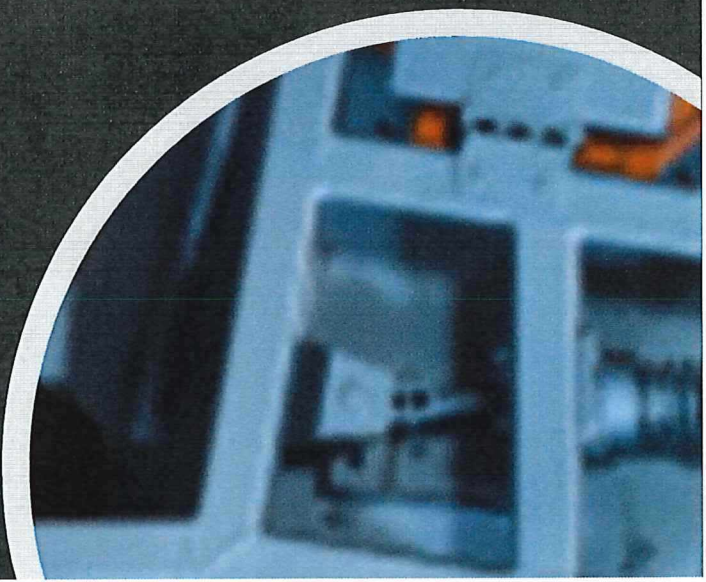
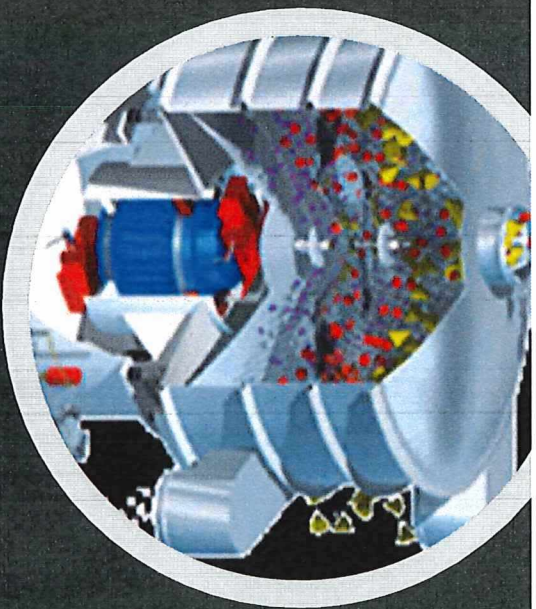
### PRO

Worked fine throughout all demonstrations / large top opening for in-feed / Fiberglass did not get hot

Adjusted screen baskets to get desired chip size

### CON

Only produces a chip



### Task 3

Material processing to conduct beta testing to free the fiber from the chip and then custom grind into standard commercial fiberglass strands with sizes ranging from 1/4-inch up to 3-inch lengths and milled gradation sizing from 10 microns powder up to 1/32-inch fiber

# Task 3

## Process equipment trials and testing

A variety of different equipment was used adjusting the intake speed, hammer type, sieve screens and equipment rpm was tested to best process the fibers from the chip

### Types of equipment used in the trials

- Hammer Mills
- Granulators
- Pulverize
- Classifiers (cyclone and sieve screen)
- Vibratory Screens
- Scalper screens

# Task 3

## Hammer-Mill

A hammer mill is essentially a steel drum containing a vertical or horizontal rotating shaft or drum on which hammers are mounted

Hammer type is selected for end purpose such as cutting to crushing

The material is impacted by the hammer bars and is thereby shredded and expelled through screens in the drum of a selected size

Hammer head type, designs and profiles

- Bull-head
- T-Head
- Ring
- Chisel
- Disc
- Knife

Exit screens sieve size adjusted to desired output



# Task 3

## Granulator / Pulverizer

Same operational concept as the hammer mill with force / pressure

Hammer type is selected for end purpose such as cutting to crushing

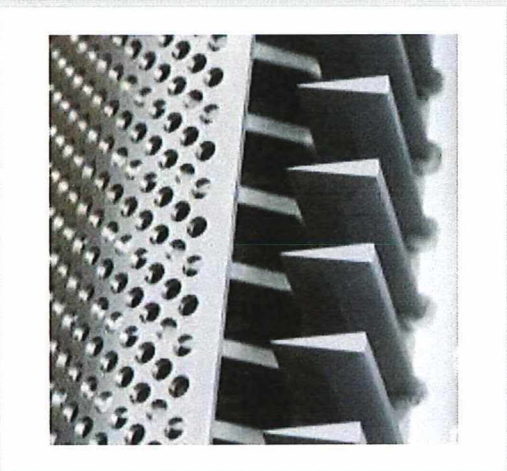
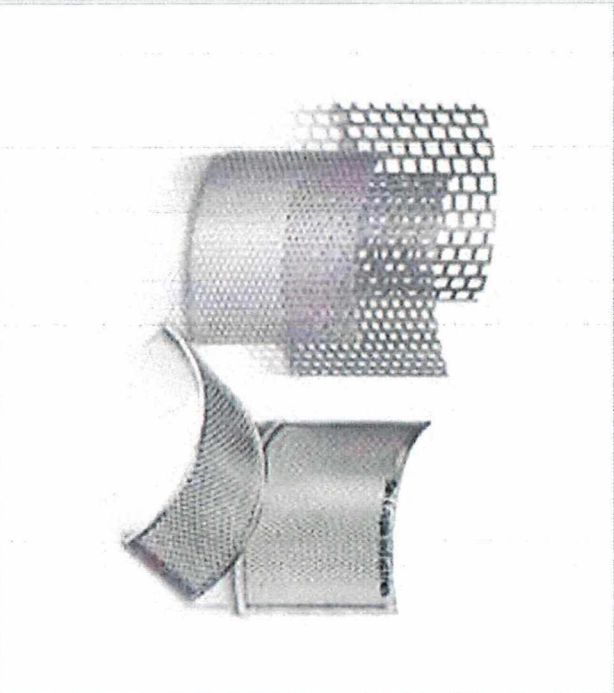
Blunt faced hammer used for impact and crushing while the sharpened knives used for shear cutting

The material is impacted by the hammer bars and is thereby shredded and expelled through screens in the drum of a selected size

Hammer head type, designs and profiles

- Bull-head
- T-Head
- Ring
- Knife

Exit screens sieve size adjusted to desired "on-size" particle



# Task 3 Classifiers

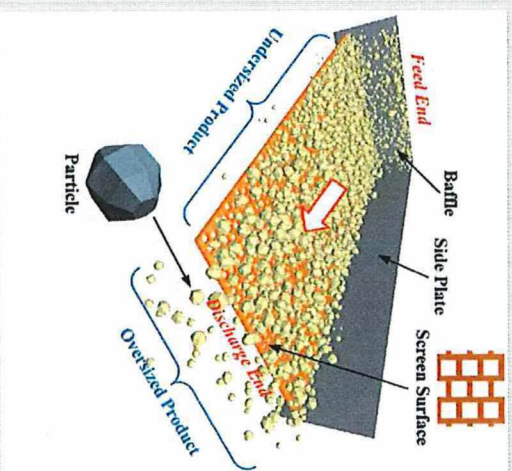
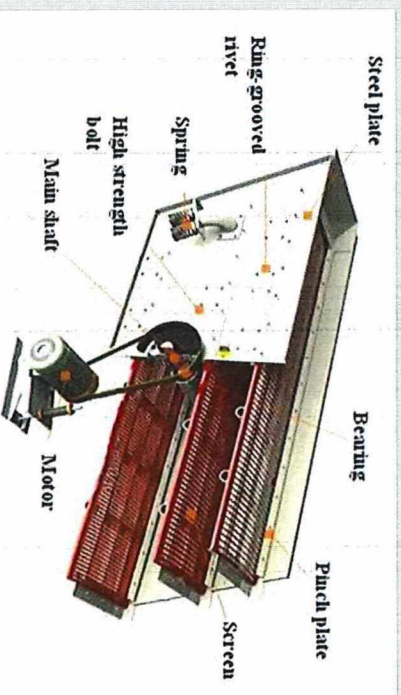
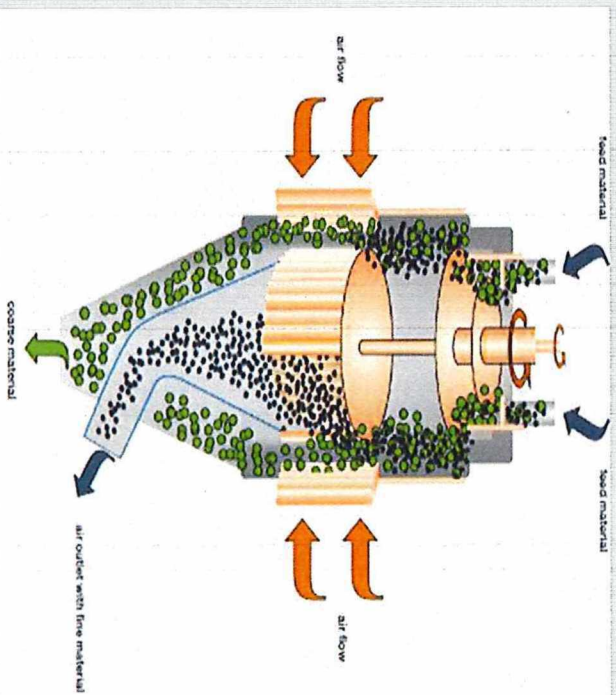
## Vibratory screens

Were used to separate the fiber sizes  
Sieve screens can be changed out to  
target size

## Cyclone Separator

Airflow enters the cyclone's inlet spiral,  
directing fine material through the vanes of  
the rotating classifier wheel while  
recirculating the coarse material for further  
grinding and separation

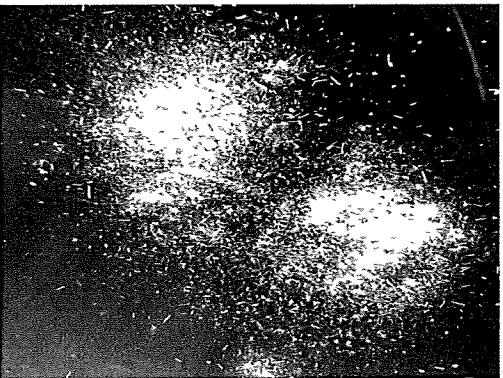
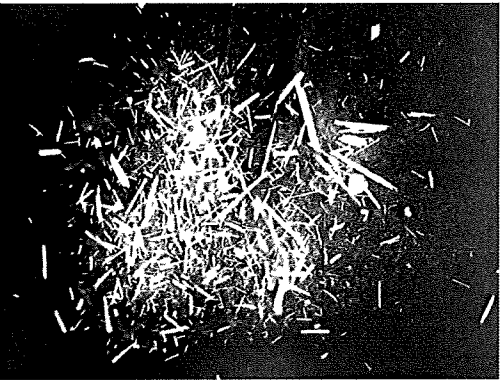
Cyclone worked for the most part to  
separate fine and coarse size processed  
materials





# Task 3

Processed fiber Sieves 14, 18, 112, 120 and Pan



# Task 3

## Process equipment findings

### Hammer and Granulator

Hammer-head type, size, spacing and speed is critical to product size and over processing of the fiber

Over processing of the fiber created pulverized, frayed and burnished materials

High speeds burnished the fiber. Fiber was brownish yellow and close to ignition

Process speed created bunching, clumping, bridging and chip kick-back

Constant monitoring of the variable speed adjustment (VSA) to dial in exact speeds to minimize fiber damage and process inefficiencies

Processing created airborne micro dust fibers. Process required complete enclosure for ventilation of airborne material

### Classifiers

Specific gravity of the balsa, foam and fiber are relatively close so no one type classifier will work

A combination of air, gravity and vibration is required to lift the fiber from the balsa and foam

A series of screens within the system is required to free the fiber length from the materials

# Task 3

## **Conclusion**

Each piece of equipment must be dialed in for desired output

Fiber chip is easily over processed

Heat and friction within the processing can easily fray and burn the fiber

Fiber can ignite

Fiber was freed from the chip and successfully tested but, additional developmental work needs to be performed with each process stage

## **Recommendations**

Alternative Processing equipment to free the fiber needs to be explored

Speed and torque adjustments to optimize size and minimize burn of the fiber

Hammer head might require a combination at different stages to maximize fiber

Equipment efficiency evaluation for commercial production capacity

**Goal is to maximize the freed fiber from approximately 40% to 70% plus**

# Task 4

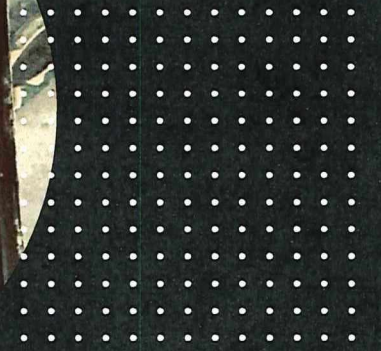
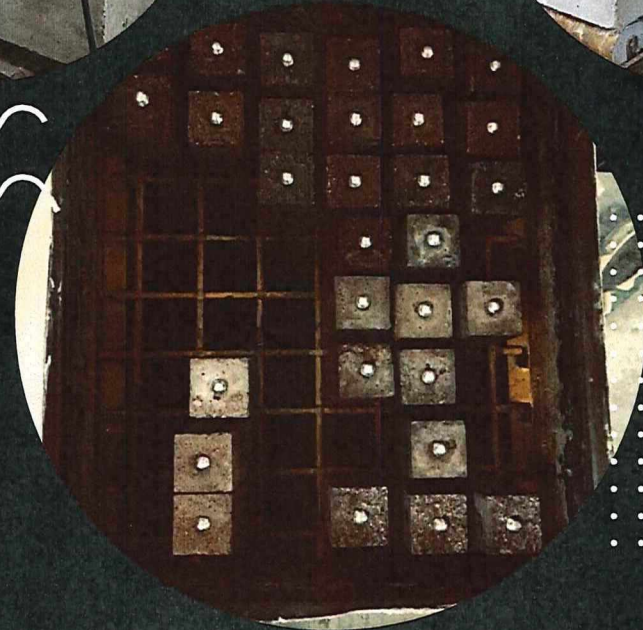
## Fiber verification testing

ASTM C-1260 Standard Test Method for Potential Alkali Reactivity of Aggregates

ASTM C-78 Standard Test method for Flexural Strength of Concrete (using simple beam with third-point loading)

ASTM = American Society of Testing and Materials

Test specimen all used same mix design and fiber weight



# Fiber Test Specimen Thickness and Length

## Standard AR Glass Fiber

Fiber Thickness 0.01 mm  
 Fiber Length 1/2" chop (13mm)

\*\* Single fiber strands

## Recycled Fiber Tested / Average

Fiber Thickness 0.125mm to 1mm  
 Fiber Length 1/4" to 1"

\*\* Mixed blend of 18 - 112 - 120

## Recycled Fiber Thickness and Length

Sieve	Thickness (MM)	Length
14	1.400	1/4" to 3"
18	1.000	1/4" to 3"
112	0.150	1/4" to 1"
120	0.125	1/8" to 1/4"
Pan	0.075	1/8" to Micro

### Fiber Tested



### Mixed Blend for Testing

18 Sieve



112 Sieve



120 Sieve



## Task 4

Goal of testing was to evaluate and compare recycled fiber material to the performance of industry standard concrete fiber reinforcements

With this approach we were able to evaluate processing and mixing of fiber in concrete and composite matrices

Dosage rates followed industry standard weight volumes for concrete and composite products

We did not factor in the specific gravity difference of the recycled fiber compared to standard virgin fiberglass

Processing and dispersion of fiber was acceptable in both polymer concrete and concrete prototype products

Recycled fiber did not fray, clump together or dry out the mix to potentially create balling / ball up of fibers

The recycled fibers had a natural rigid form which did not affect mix design slump and workability



# ASTM C-1260 Standard Test Method for Potential Alkali Reactivity of aggregates

Alkaline resistance (AR) is a limiting factor when utilizing glass fiber reinforcements in concrete applications

Current methods to protect virgin glass fibers from alkali degradation in concrete require high zirconium content and an AR sizing or coating applied in the manufacturing process of glass fiber reinforcement

Recycled fibers performed well within the acceptable range with virtually no percentage change



August 7, 2020  
Polymers Center  
6812 North Glen Way  
Johnston, Iowa 50131  
Attn: Mr. Mike Olson.

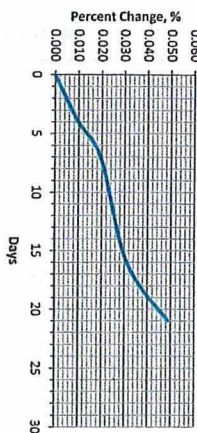
Project No: 201491 PCCG  
Re: Alkali Silica Reactivity  
ASTM C-1260  
Raccoon River Concrete Sand - Fibers

Our lab has completed testing of cement bar samples created on July 15, 2020. Listed below are the parameters of the test method and results of the test.

**MIX PROPERTIES**  
Material: Raccoon River - Concrete Sand with 5 lbs Fibers  
Cement Type: Holcim Type III  
Water to Cement Ratio: 0.47  
Percentage of Fine Aggregate, %: 100  
Percentage of Coarse Aggregate, %: 0  
Mixing Temperature, °F: Sodium Hydroxide  
71

TEST RESULTS					Average	% Change
Date	Specimen No. 1	Specimen No. 2	Specimen No. 3	Average	% Change	
Initial Reading, inches	716/2020	11.0142	11.0128	11.0119	11.0130	0.000
4 Day Reading, inches*	716/2020	11.0188	11.0137	11.0127	11.0141	0.010
7 Day Reading, inches*	723/2020	11.0165	11.0149	11.0142	11.0151	0.020
16 Day Reading, inches*	817/2020	11.0181	11.0156	11.0155	11.0164	0.031
21 Day Reading, inches*	805/2020	11.0213	11.0174	11.0164	11.0184	0.049
28 Day Reading, inches*	815/2020					
Average Expansion, %				0.049		

\*Recorded after initial cure period.



Please feel free to call should you have questions or if I may be of further assistance.

Sincerely,  
*Scott K. Farnick*  
Scott K. Farnick, P.E.  
Principal Engineer  
M.T.S.F.

1610 East Madison Ave. • Des Moines, Iowa 50313  
(515) 263-0794 • Fax (515) 263-0851  
www.cmt-iowa.com

# Task 4

## Findings

Alkali resistance of fiber is essential for use as concrete reinforcement

Alkali Resistant (AR) Glass Fiber is glass fiber with added zirconium oxide to help resist attack from alkalinity

AR fiber is required for use in the highly alkaline environment of portland cement-based concretes

Normal fiberglass (e-glass) degrades in concrete due to the aggressive alkaline environment

AR fibers have been widely used in the concrete industry since the 1970's with standard ASTM testing methods

Glass fiber allows for thinner and lighter weight concrete. Steel reinforcement is no longer necessary in some concrete applications

**Evaluation of the recycled fiber performed equal to that of currently available alkali resistant glass fiber products per ASTM C-1260 which is the industry standard test method to evaluate performance**



# ASTM C-78

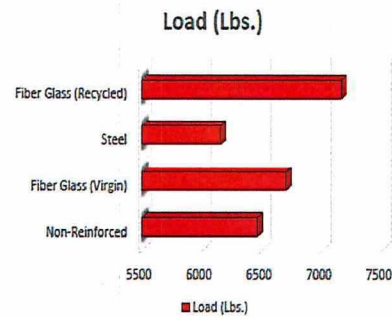
Standard Test Method for Flexural Strength of Concrete (using simple beam with third-point loading)

Tested the recycled fiber against non-reinforced, virgin AR-GF (fiber) and steel fiber

## Concrete Modulus of Rupture

Sample Type	Non-Reinforced	Fiber Glass (Virgin)	Steel	Fiber Glass (Recycled)
Days	7	7	7	7
Load (Lbs.)	6,458	6,695	6,150	7,160
Modulus of Rupture (PSI)	540	560	515	565

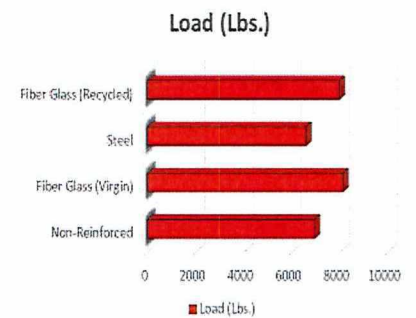
Test Method: ASTM C 78



## Concrete Modulus of Rupture

Sample Type	Non-Reinforced	Fiber Glass (Virgin)	Steel	Fiber Glass (Recycled)
Days	28	28	28	28
Load (Lbs.)	6,921	8,098	6,560	8,175
Modulus of Rupture (PSI)	580	675	550	657.5

Test Method: ASTM C 78



Tests show load pounds at 7 day and 28 day sampling

# ASTM C-78

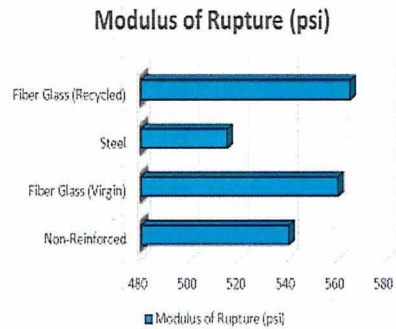
Standard Test Method for Flexural Strength of Concrete (using simple beam with third-point loading)

Tested the recycled fiber against non-reinforced, virgin AR-GF (fiber) and steel fiber

## Concrete Modulus of Rupture

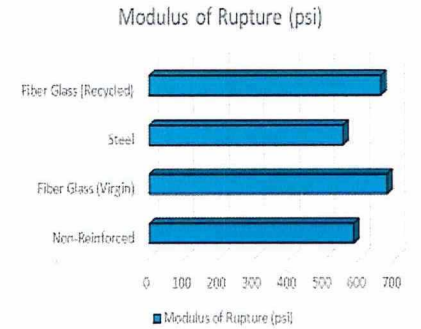
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Test Method: ASTM C 78

Tests show Modulus of Rupture PSI at 7 day and 28 day sampling

# Task 4

## FINDINGS

ASTM C-78 Concrete Beams / Bend Testing determines the flexural strength of concrete by a simple beam with third-point loading

Modulus of rupture is a measure of the tensile strength (pull) of concrete beams or slabs

Modulus of rupture is also known as flexural strength, bend strength or fracture strength

Flexural strength identifies the amount of stress and force a concrete slab, beam or other structure can withstand such that it resists any bending failures

Third point loading tests or flexural strength tests were conducted at CMT following accepted ASTM concrete design & test methods

Test was performed to show benefit or increase in performance

Comparison with commercially available fiber reinforcement used by concrete producers

Recycled fiber-reinforced concrete beams performed equal to standard or virgin fiber-reinforced concrete beams

## Task 4

Recycled fiber cast into  
standard Portland cement  
concrete and polymer  
concrete

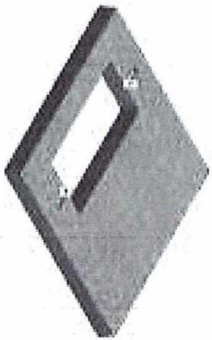
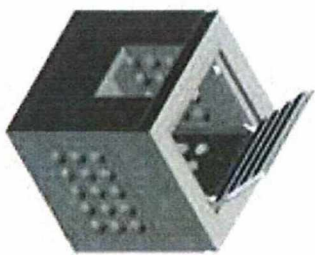


# Potential Applications

Following slides show a variety of potential applications for both the recycled fibers and powder materials

These applications all use different forms of reinforcement and fillers

The recycled materials could benefit the potential user with cost saving and promoting the use of a recycled product



# Wind & Solar Energy Products

Trench Systems

Trench Pull Boxes

Hand Holes

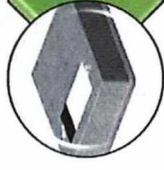
Box Pads

Flat Pads

# Wind Turbine Industry



Cable Tray Trench & Covers



Equipment Boxes



Transformer Pads



Hand Holes Boxes



Pull / splice Boxes

## Additional Products



Power Generation / Wind Turbine Industry



Manholes



Median Barriers



Grout Kits



Spray Coatings (rehab)



Soil Stabilization



Flowable Fill



## Additional Products



FRP & PC Pipe



Manhole Grade Rings



Manhole Frame & Covers



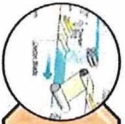
FRP Tanks



FRP Pultrusion Parts



Bulk Compound Molding



Sheet Compound Molding

# Pre-blend bag mix

## Brands

- TCC Materials  
Portland Cement
- Quickrete
- Sakrete
- Techmix
- ProSpec
- Rapid Patch
- Specmix

## Products

- Cement
- Concrete
- Mortar
- Grouts
- Stucco
- Shotcrete
- Repair &  
Restoration



# Task 4

## Findings

Recycled fibers, impregnated with resin in blade manufacturing process, has an acceptable level of alkali resistance. (ASTM C-1260)

Recycled fiber reinforced concrete beams tested equal to industry standard (virgin) fiber reinforced concrete beams (ASTM C-78)

Recycled fiber did not negatively affect mix design and performed on an equal level with industry standard fibers

## Key Items

Highly competitive marketplace for concrete reinforced fiber

Received positive feedback with potential use of recycled fiber from concrete producers

Important steps & requirements for commercialization and market entry

Quality Control and consistency of processed fiber needs to be dialed in and recorded / ISO 9001

Consistent inventories and supplies are a key factor in maintaining quality control and product consistency

Price competitive with commercially accepted reinforcement fiber

Industry familiar distribution channels

DOT / agency approvals are paramount to wide acceptance and use in marketplace

# Task 4

## Recommendations

Further research is warranted to evaluate production scale mixing, processing, and finishing in ready mix and precast applications

Long-term shrinkage and crack control testing for applications such as flat work and precast

Work with ready mixed concrete producers for full scale demo of slab on grade concrete placement to evaluate shrinkage, finishing, and crack control workability comparison and evaluation with current fiber reinforcement in use

Work with precast producers to evaluate mixing, processing, finishing on standard production precast products

Set up and supply demo for grout kit applications for both cementitious and epoxy grout manufacturers and suppliers

Full product demo applications - precast vaults, pads, etc.... used by power generation companies

Coordinate demo application with Iowa DOT, Intrans, Iowa concrete paving association members to evaluate fiber in paving application

Coordinate demos with American Composite Manufacturers Association (ACMA) members for use as replacement filler/fiber in production

Identify and arrange demo usage for bag mix producers

Favorable specifications for recycled content products (composite and concrete) in procurement & bid documents from power generators

## Task 4

### Next Step

**Work with the Iowa Energy Center Program along with the Department of Energy and National Science Foundation to apply for additional grant/s to refine processing and initiate commercialization of the recycled fibers**

# Thank You

Prepared and presented by Polymer Crete LLC  
[www.polymercrete.com](http://www.polymercrete.com)