

February 29, 2016

Maine Department of Environmental Protection  
Regulatory Assistance Small Business Ombudsman  
Attention: Julie Churchill, Ombudsmen  
17 State House Station  
Augusta, Maine 04333-0017

Re: Fiberight, LLC & MRC Project – DEP# S-022458-WK-A-N

Dear Ms. Churchill,

Thank you for providing me a copy of the correspondence from CES, Inc. to my February 1, 2016 partial analysis of portions of the solid waste permit application for the Fiberight, LLC and the Municipal Review Committee (MRC) for the proposed solid waste processing facility in Hampden. (Project number DEP# S-022458-WK-A-N). I am responding to the applicants February 9, 2016 submittal to the Department of Environmental Protection (DEP) and including some further analyses of the remainder of the 534 page solid waste processing and recycling facility permit application, as well as the additional “deliverables” from CES, Inc.

I do appreciate the fact that the applicants answered a number of the points and questions that I raised in the February 1, 2016 memo as a resident of Orrington. I am also encouraged to see that my specific questions have lead to some clarity to the Fiberight project in Hampden. It is interesting to note that they spend the first part of their response giving their opinion as to whether my analysis has any validity to begin with, and then they go on to validate some of my points by providing substantive answers to my questions.

I will follow the same format as the applicant by providing technical opinion on their initial comments on the validity of me asking questions and then counter their views/opinion with facts, both non-technical and technical. I then am following up that discussion with other technical questions.

Unfortunately, they also provided “non-answer” answers to the points I raised. So I will re-raise those points, specifically whose anaerobic digester vendor package they are going with and why. From my prospective, some parts of the solid waste permit application were hastily assembled and submitted to meet some artificial deadline of the applicants and CES has had to repeatedly provide supplemental information to the Maine DEP and correct or clarify issues raised during the permit review process.

Imagine the challenge for non-technical people to follow the Fiberight project. Less than two years ago, Fiberight was part of the MRC’s ill-fated efforts to have CES, Inc. site a landfill in Argyle or Greenbush for a brand new landfill. I am reminded of the Towns that signed on to the April 1<sup>st</sup>, 2014 application by CES for a Determination of Public Benefit that were not even aware that they were supporting a new landfill for the MRC. That permit application initially that supported waste management elements that included the existing Penobscot Energy Recovery Company (PERC) operation in Orrington, and then within 2 months, CES, Inc. provided supplemental information that did not support any type of continued relationship with PERC.

When the Determination of Public Benefit application/approach failed to garner public support and DEP permit approval, the Fiberight project took on a series of new “marketable product lines” and confused the public even more. Even those in the media that follow the Fiberight project were confused and couldn’t follow what was going on. The Mount Desert Islander headlined an article as recently as November 4, 2015 where they cited “Trashanol” in its headline of the products still being part of Fiberight project proposed for Hampden. See link: <http://mdislander.com/maine-news/trashanol-contracts-drafted> Today,

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the output products are not ethanol made from trash, not industrial sugars for sale, not engineered fuel briquettes, and not wood waste to produce internally generated power from gasification.

The bottom line is that the engineering, technical, marketing, and socio-economic aspects of the Fiberight project have kept changing, and there is no indication that the various unit operations and processing technology have been tested and proven to work as conceived. Hopefully, the points raised in the following pages will glean some new points of clarity to a project that is far from offering a clear picture of its viability.

I would appreciate it if you could provide me with any and all comments or questions that you or your staff may have pertaining to this submittal. As you have previously done, should you receive responses from the involved parties to the Hampden project regarding this analysis, I would certainly appreciate receipt of them and again have the opportunity to respond.

Sincerely,

*Keith A. Bowden*

Keith A. Bowden

Resident: Town of Orrington

## Part 2: Responses to Applicants Feb. 9, 2016 Memo and Continued Critical Analysis of Errors & Omissions found in MRC/ Fiberright Solid Waste Permit Application on Hampden Project & Deliverables from CES

**1. Applicant's Opinion:** On February 9, 2016, CES and the applicants responded to my analysis of errors, omissions by leading off with the following viewpoint:

- Mr. Bowden references sections of the application pointing out that the information provided is inconsistent; however, it surprisingly appears that he has not recognized and taken into account that much of what is being identified as inconsistent information is merely the difference between updated information posted versus the original information that was posted.

**Technical Response:** I fully recognize the timeline of projects and that small adjustments can be made and minor design and technical aspects can change over time. I was Project Manager for a "Greenfield" solid waste landfill development project for a paper mill I worked at in the late 1980 and early 1990's. We spent 2.5 years planning, preparing the design and engineering documents, submitting them to the environmental regulators, and obtaining permits to construct a landfill for the facility 18 months later. Changes to Fiberright's permits (for a project that has been in the works for nearly two years) are typically driven by regulatory reviews, the statues requirements that must be met as opposed to those changes that are under the control of the applicants. I understand that the regulatory reviews can dictate the many revisions by the applicant to the general process diagram showing a network of trenches and drainage system for collecting spills, tank overflows or line ruptures, operator errors and other mishaps. But, I still don't see in the general process diagrams where the hundreds and thousands of gallons of phosphoric and sulfuric acid, urea, sodium hydroxide (caustic), and other chemicals are going to be safely stored. I also don't see any depiction/discussion in the permit application of whether the tanks, drums or totes are in diked/curbed areas and transferred throughout the facility in double walled pipes that are clearly labeled to protect employees and the environment. This includes the means and methods of transferring process water liquids and slurries to all of the anaerobic digestion tanks/silos that are outside the enclosed building and sitting in the open environment. Are these lines double walled to minimize or prevent releases to the environment?

Perhaps there were regulatory reasons for the applicant's initial stated plans to collect and gasify the wood wastes coming in with the Municipal Solid Waste (MSW), and then by mid-November the recovered wood was not going to be blended with the Post Hydrolysis Solids (PHS), gasified for energy recovery. Why all of a sudden, were wood residues that were collected now, instead going to end up in the Norridgewock landfill. Can't that wood instead go to a pelletizing operation as the public was told might be the case?

Many of my notations of "inconsistencies" in the solid waste permit application fall into that area of control by the applicants that should have already been worked out by the applicants before the permits were even submitted to the Maine DEP. I have never witnessed a project that has been so dynamic, ever changing in what the applicant dictates/states in the permit applications and submitted to the regulatory agency versus the disconnect from public statements that have been made before, during and after permit submittals.

**2. Applicant's Opinion:** The applicant states the following:

- It also appears that Mr. Bowden has made some confusing statements regarding the Fiberright process as readily evidenced by (1) the disconnect between his statements in Section 1 of his critical analysis that seems to imply that sugars are the major plant output, downplaying the

actual process pathway of anaerobic digestion, relative to his Section 8 where he claims that anaerobic digestion is “the most critical part of the Fiberight process” and (2) where he fails to recognize the use of continuous pulping in the applicants submission.

**Technical Response:** Apparently, the applicants are themselves confused in thinking that Fiberight is not a multitude of processes with key unit operations that was purported to be producing key products. Let’s look at the first part of their opinion: “the disconnect between his statements in Section 1 of his critical analysis that seems to imply that sugars are the major plant output, downplaying the actual process pathway of anaerobic digestion”. ***In my view, there is no disconnect for anyone to think that industrial sugars was a key product in the spring of 2015 (since the key product Trashanol made by the sugar fermentation vessels and ethanol distillation unit operation was no longer considered viable) and that the product methane made via the anaerobic digestion process would produce marketable natural gas once the applicant provided the technical aspects of a bio-gas clean-up system design. Before that design was presented on the DEP’s website on December 14, 2015, one had no idea that the methane produced from the process was indeed “marketable”.***

If one reflects on what Fiberight and the MRC stated publically before, during and after the permit application submittal on June 15, 2015 and the technical aspects that the applicants have submission control over, anyone would become confused. For a rather extended period of time, (spring of 2013 all the way up to February 2015), we were told about how Fiberight was selected over more than a dozen other technologies/companies and that it would be producing Trashanol, engineered briquettes, industrial sugars and biogas. Fiberight said it had a new plant in Iowa under construction and a pilot plant facility in Lawrenceville, Virginia (or was it a demonstration plant or was it a commercial plant, it kept changing). Anyway, Iowa was going to produce ethanol from municipal solid wastes at a former corn ethanol plant they bought in 2009. They had made some Trashanol from International Paper Companies waste paper in 2010, were ready to take the Fiberight process to the world in Blirstown, Iowa and were ready to make 6 million gallons of ethyl alcohol per year in 2012, or 2013, 2014, 2015, or maybe 2016. For half a decade, newspaper and website articles have been talking about Fiberight projects launching a new way of producing ethanol from MSW, starting in Iowa. By April 2015, Fiberight pulled back on operating the Blirstown Trashanol facility along with the waste separation facility in Marion, Iowa and would now focus its efforts on industrial sugars and biogas – methane there.

In late 2014, the Hampden plant was announced by the MRC as the second Fiberight plant to be constructed by Fiberight in the world. On February 4, 2016, the University of Maine’s Forest Bioproducts Research Institute (FBRI) team gave their presentation to the public on the newly announced project in Hampden and I was in attendance. FBRI had been contracted to conduct a peer review of the Fiberight technology to produce industrial sugars via enzymatic hydrolysis of the cellulose fraction from the process with their technology partner Novozymes, that the sugars were going to be cleaned and concentrated up to a specification that would lead to the production of ethanol from MSW, the so-called Trashanol, and some industrial sugars could be diverted to a biogas (methane via Anaerobic Digestion) at certain times of the year (winter periods) and to a gas pipeline the rest of the time. At that presentation, no one announced that the production of Trashanol was not to be done at the Hampden facility in Maine. After receiving the FBRI presentation report and the power point presentation, I discovered that no ethanol production would be done in Maine. I waited patiently for the minutes of February 4<sup>th</sup> meeting to come out on the MRC website to see if I missed the announcement that Trashanol was dead. Such a critical pronouncement was nowhere to be found in the minutes of that meeting and not found in any public pronouncements, or clearly stated in subsequent meetings in the following months. Trashanol was no longer a “key” product to be made in Maine.

In the spring of 2015, the Hampden project reported to the public that they would likely be diverting some of the sugars to methane production when markets dictated; say the 3 months during the cold weather

when the demand for natural gas was high. That made marketing sense, so nine months would be devoted to industrial sugar production. They also stated that the commercial methane that would be produced would also allow them to put in a natural gas refueling station at the Hampden facility for waste haulers and even service local Hampden vehicles equipped to handle it.

So that left me and others to focus on the June 15, 2015 Solid Waste Permit application and the important technical, marketing and socio-economic aspects that I expected to be part of the permit. The documentation in the Solid Waste Permit application cited Fiberight's promised plant in Iowa that was to be of a similar size to Hampden's. (By the fall of 2015, even the Marion, Iowa MSW sorting/cleaning and production of recyclables plant was mothballed, so it would not be built and operating before Hampden's). In advertizing circles, what the municipalities in Iowa have been witness to is what is called "bait and switch".

Hampden was looking like the first project using the Fiberight unit operations to make industrial sugars via the enzymatic hydrolysis operations/equipment and methane via anaerobic digestion. Yet the permit application and the process flow diagrams that were referenced in the June submittal, (but not made publically available until late December 2015) presented contradictory statements on what was 1) to be produced for products (or maybe not produced), 2) what process equipment was going to be utilized, (and what equipment was to be installed in the future, and require permit modifications). Now the February 9<sup>th</sup>, 2016 response has introduced some new equipment vendors/partners by the name of Graphite Technologies. Simply put, the applicants have had control of want information was to be included in the June 15, 2015 permit application and they have backtracked on what was told to the public in Orono on February 4<sup>th</sup>, 2015 and Hampden on April 27 and May 5, 2015, and numerous informational meetings.

**3. Applicant's Opinion:** Now let's look at the other part of the applicants' February 9, 2016 response statement. "It also appears that Mr. Bowden has made some confusing statements regarding the Fiberight process as readily evidenced by .... relative to his (sic) Section 8 where he claims that anaerobic digestion is "the most critical part of the Fiberight process"

**Technical Response:** Since ethanol, industrial sugars, engineered fuel briquettes, and energy recovery from the gasification of 24 tons per day of recovered wood waste are no longer products to be produced by the Fiberight process, anaerobic digestion is, in my view a "critical part" of the operation as it is producing the marketable natural gas. So yes, this unit operation is significant and warrants a response that was the only one not responded to in the applicants' memo to the Maine DEP. To repeat my statement in Section 8:

PFD #10 shows the Anaerobic Digester (AD) system as a vendor package unit and does not provide any significant detail. Attachment 13 – Process Design – Maine Process Description section provides a total of 9 sentences on the most critical part of the Fiberight process. This is woefully inadequate.

Fiberight is also claiming it is using a "proprietary anaerobic digestion system", when later in Attachment 13, the University of Maine FBRI team provides repeated references to the Voith digestion system at the Virginia Pilot Plant and subsequent plans to use the Hydrothane Expanded Granular Bed (EGB) systems at the now mothballed Marion, Iowa facility. Are the Fiberight plans for the AD system proprietary or are they now at a loss as to what will work in Maine for this vital operation? One can hardly find a reference to the EGS Anaerobic Digestion system promoted on the Hydrothane website, unless it is under a new/different name.

I await a response as to whether Fiberight has identified the vendor for the "critical" anaerobic digestion operation. From a technical standpoint, this anaerobic digestion process is the one unit operation that is completely outside and subject to releases to the environment of liquids, digester solids, and gases from

the vendor package. What provisions/safeguards have the DEP required of the applicant to avoid such releases? Are the applicants utilizing any of the following: 1) double walled tanks, secondary spill containment around all the tanks in the form of impermeable dikes, pads, curbs and walls, 2) double walled transfer pipes and lines for these systems that are above or belowground, and 3) spill avoidance provisions at the outside sludge transfer station?

**4. Applicant's Opinion:** "It also appears that Mr. Bowden has made some confusing statements regarding the Fiberright process as readily evidenced by ... (2) where he fails to recognize the use of continuous pulping in the applicants submission.

**Technical Response:** In the June 15, 2015 permit application submission and at various meetings, before and after that date, the applicants have repeatedly directed the public to view the "You-tube" video which describes the Fiberright process at the Lawrenceville facility and prominently displays the autoclave used to sterilize the sorted/separated materials to start breaking apart the cellulosic material for subsequent washing in the continuous-batch unit. The autoclave is referenced 5 times in the permit application, and the continuous pulper is mentioned 3 times in the permit application. Without design specifications, listings of manufactures of the some of the equipment proposed to be used in the Fiberright process, throughput rates, etc. it is challenging to identify what equipment is in fact being proposed for use. It now appears that the Vickers Seerdrum continuous tunnel pulpers are going to be used at atmospheric conditions, rather than the vendor Fiberright partnered up with around 2010 (cleantech Biofuels) that employed a rotary pulper with steam and pressure to heat, clean and separate MSW into biomass for subsequent washing. Or is Fiberright planning on using some other company continuous pulper employed in Europe where mechanical biological treatment is utilized? One cannot ascertain from the permit application what equipment is being used or what the expect performance and reliability of the tunnel pulper will be without further details and without the applicants response to public inquiries.

**5. Applicant's Opinion:** The applicants' final opinion they provided in their response memo as to whether my analysis has any validity ended as follows (before answering 7 of 8 points):

- The applicants have, on numerous occasions, engaged with Mr. Bowden and offered direct communication to include meetings with Fiberright engineers to resolve any questions he may have which if accepted, may have also provided sufficient information to avoid some of the confusion apparent in his analysis. The applicant had also communicated intent to listen to Mr. Bowden regarding any valid comments or suggestions that could potentially be included in final design of the plant, but he has also failed to take Fiberright up on their offer.

**Response:** I do not know of any credible efforts by any of the applicants' engineers or principals of Fiberright to contact me, or know of any offers to engage with me, nor has there ever been any offer of "direct communication to include meetings with Fiberright engineers". I have never met the Senior project scientist nor talked to the Senior Project Manager for CES, Inc., nor been invited to meet with the Fiberright design engineers to discuss any questions that I may have. I ask the MRC, Fiberright or CES provide a written memo, email, phone record or other communication supporting the purported offer of direct communications. Perfunctory statements at the end of meetings, presentations etc. whereby someone says "if anyone has any questions, please don't hesitate to contact " so and so is not an example of having been offered direct communications, or offers for meetings with Fiberright engineers to resolve any questions I may.

Having attended all of the regular and special meetings of the MRC since February 2015, I recall of only one occasion of being directed asked (after the regular meeting was adjourned) by the MRC president, Mr. S Chip Reeves, if I had any questions. I stated that I did not as the focus of the meeting was on legal contracts and had nothing to do with design or permit application issues.

On November 19, 2015, I spoke for 5-6 minutes in Hampden at a public meeting that the DEP required of the applicant. I gave my background/expertise in pulp & paper, pilot plant operational experience, enzymatic hydrolysis expertise, and I referred attendees to the Hampden meeting to Orrington's website for technical questions raised about the Fiberight technology that citizens/residents should carefully consider. No representatives from CES, MRC or the CEO of Fiberight came up to me and provided me contact information with Fiberight engineers and to listen to (as the February 9<sup>th</sup>, 2016 memo states) "any valid comments or suggestions that could potentially be included in final design of the plant."

Mr. S Chip Reeves noted the following in a November 5, 2015 email to Charter Municipalities, as well as the Town of Orrington:

- "I want to take a moment to give you an update on our recent efforts as we progress with our Post-2018 comprehensive solid waste management solution..."

You may receive, or have already received, correspondence from the Town of Orrington or a resident of Orrington that purports to provide a careful review of the Fiberight project, followed by a varied list of questions and concerns about the project. Be assured that the MRC can address all of the concerns raised. We are preparing a response now, which we will share with members. The MRC appreciates the challenges that the Town of Orrington is facing at the pending closure of its largest taxpaying facility and has done its best to include the Town in its planning process".

Mr. Reeves concludes his Nov. 5 email by stating, "MRC is committed to addressing all comments and concerns about the project".

This statement by Mr. Reeves came right after the DEP, MRC and all the Charter Town's received the first analysis released by the Town of Orrington on October 27, 2015 of the University of Maine's Forest Bioproducts Research Institute (FBRI) team referenced earlier in these current technical analyses. As of this date, February 29, 2016, the applicants (which include the MRC) have not responded to the Town of Orrington's sixteen pages of inquiries/questions of the 48 page University FBRI team report and the Power Point show. A summary table to the question's that the Town of Orrington never received a response to is attached to this critical analysis memo. **I ask the permit applicants to respond to the Town of Orrington's questions in the attached table as the MRC has pledged to do as noted in the written documentation excerpted above.**

On numerous occasions, representatives of the applicants have stated that the Town of Orrington's property adjacent to PERC or the PERC site itself was considered for a Fiberight facility, as well as the selected Hampden site. At a MRC Informational meeting in Orono on December 6<sup>th</sup>, 2015, an audience member asked why property adjacent to the PERC plant for an independent Fiberight facility was not considered as an option to Hampden. Mr. Greg Louder, executive director of the MRC told the questioner that an impartial, alternative analysis/study was conducted and the numbers were such that PERC/Orrington came in second to Hampden, which was "found to be the most viable site". A matrix table with the analysis by CES was to be provided to Orrington's Town Manager, but it has failed to materialize. **I ask the applicants to provide such an "options analysis" with the numerical rating system included that purports to show the Hampden "Greenfield site" as superior to the Orrington location.**

At a MRC meeting on July 23, 2014, the CEO of Fiberight himself noted that the PERC facility was a potential site for a Fiberight recycling and processing plant serving as a "hub" and aggregation stations and a processing facilities serving as the "spokes". Mr. Craig Stuart-Paul noted that the "focus would be on recycling first ... **He suggested that in some ways PERC would be a perfect site for such a hub but acknowledged that the MRC has been unable to interest PERC's general partner in engaging in discussions of alternatives to the existing RDF based waste-to-energy technology.**" (emphasis

**added).** That quote is excerpted from the minutes of that July, 2014 meeting, which are only available in “draft” form. Mysteriously, the final, approved minutes of that 2014 meeting that would reference PERC as a “perfect site” have never been included on MRC’s website, as are all other minutes of the MRC meetings. The draft minutes were included by CES in one of the supplemental responses to the April 1<sup>st</sup>, 2014 application by them for a Determination of Public Benefit for the Greenbush/Argyle landfill project, but nowhere else can they be found. **Will the Maine DEP look towards bringing the various parties together to truly look at the pros and cons of working with PERC or the Town of Orrington rather than allowing the disruptions and environmental impacts inherent with the Hampden site?**

**6. Technical Inquiry:** The Fiberight process has referenced on numerous occasions in the June 15, 2015 permit application that the washed pulp will be processed thru either a medium or low consistency refiner to aid the subsequent hydrolysis step. From first-hand experience as Project Manager for a \$ 1.25 million refining project on relatively clean, source separated purchased, market recycled pulp to be used to make recycled paper, (Champion Mill, Deferiet, New York), the presence of small bits of plastic can quickly blind over the refiner plates. These carbon or stainless steel plates spin in close proximity to each other to shear (break open) the cellulose pulp fibers. These pulp fibers are then more amenable to the enzyme hydrolysis step for converting them to sugars. Without the so-called centrifugal forward and reverse cleaners ahead of the refiner to spin out the tiny plastic pieces, good refining can not be accomplished and poor enzymatic hydrolysis conversion of cellulose to sugars will be the inevitable result. Has Andritz actually tested a truly represented washed pulp stock in laboratory refiners to ensure that the plastic is non-existent and that centrifugal cleaners are not required in the process design parameters?



Table 1: Technical Analysis of U Maine FBRI Team Report on Fiberight – 2/4/15		
Doc.- Pg #-§#-Line #	Quotation - Point of Inquiry / Interest / Concern	Technical Analysis - Comments
<i>I. Major Process Flow Steps/Unit Operations keep changing, data unclear/not given to FBRI, or process was not tested</i>		
SUM #7 - §1- #6-7	“Fiberight is planning to ferment sugars to ethanol in Iowa, but is not planning this step in Maine”	Significant change not emphasized/highlighted at meetings –No “Trashanol” in ME/IA projects despite years of publicity
SUM #1 - §3- #3	“no data on Fiberights’ operating experience on combustion or gasification of residual post hydrolysis solids”	This presents an unknown risk in the engineering, design, procurement for MRC commercial plant in Maine
SUM #5 - §5- #2-3, 5-7	“significant operating experience with a small commercial AD installation, using 8,000 gallon Voith R25 reactor”	“Fiberight now is working with Hydrothane” whose AD process Fiberight has not tested at pilot plant or demo level
SUM #8 - Flow Figure	Prior Samoset Resort Mtg-April 2014 shows wood waste as PEF (Process Engineered Biomass Fuel) but not apparent now!	What is to be done with wood wastes? Fiberight process won’t digest wood to pulp/hydrolyze with enzymes to sugar
SUM #7 - §3- #9-10	“Transportation of clean sugars to the end user will need to be evaluated for cost and possible contamination”	Expert APP D-#1 §3-#5 notes “the expense of drying sugars [to granular] to minimize shipping cost” is a major issue!
SUM #7 - §4- #2-3	“Process description supplied by Fiberight does not adequately specify on-site waste water treatment and disposal needs” .	Also noted in PPS #5–§1 #1-2 by FBRI Project Team.
SUM #7 - §4- #4-6	“A full mass and energy balance should be obtained and reviewed because it is needed to fully understand....impacts”	MRC should be concerned with true capital costs of project, and whether tipping fees are justified for post 2018 period.
APP A #4,6-7- etc	9-26-14 memo to Maine DEP has many Ethanol Fermentation references, but ethanol now been dropped from Maine project	Significant/not emphasized –No “Trashanol” in Maine project so why are capital cost high, tipping fees high/going higher?
APP B #2- §3- #2-3	“Suspended solids are about 12%, but can be as high as 20%.”	Personal lab/pilot plant experience with high consistency hydrolysis shows 20% solids level is not technically viable!
APP B #2- §6- #1-2	Fiberight “exploring moving the refiner” at VA pilot plant	Still experimenting to improve critical hydrolysis step!
APP B #2 - §5- #4	“No data on the sugar purity was made available”	Major risk to Fiberight product sales and market development without detailed sugar purity data and specifications.
APP E - #1 - §1-#1-2	“We do not have a detailed process flow diagram or a material balance that is necessary to estimate ....emissions”	Fiberight needs to define process flows/do economics study.
APP E -#2 -§6 –#1-3	“Fiberight .... process is self-contained .... no by-products that must be managed”	“However, without detailed process flow diagrams.... it is not possible to confirm these claims” per subject matter experts!
<i>II. Some “Subject Matter Experts” concerns NOT highlighted, addressed, or are contradicted by FBRI</i>		
APP D-#1-§6 –#1-3	“... two thirds of total mass balance unaccounted for.”	Can Fiberight answer/give material balance info to public?
APP D-#1-§7 –#1-3	Poor “conversion of MSW....suggests a high level of inhibitors”	Further investigation required for how clean sugars must be!
APP E -#1-§5 - #1, 5-6	“Brownfield sites offer potential advantages....should be considered a part of the facility siting process”	Not mentioned by FBRI in SUM Report or Power Point Slides. Brownfield or the existing PERC site or adjacent land may offer advantages over Greenfield (Hampden)
PPS #5 – 4-1 vs, SUM #9-§3 #11-13, APP #2 -§3-#1-4	“Permitting process could take 6 months to one year” in PPS page 5 major bullet point 4 (PPS #5 –4-#1)	“Once FEL3 is completed, the permitting will take conservatively 12 months for a greenfield site” SUM #9-§3-12

KEY To Above Table - Column 1: Example: SUM #7 – §1- #6 is the Summary Report by the U Maine FBRI Group, page #7, paragraph 1, line #6

PPS = U Maine Power Point Slide Presentation

SUM = U Maine FBRI Summary Report - Technology Review of Fiberight Process for MRC

APP = Appendix A - E

Table 1: Technical Analysis of U Maine FBRI Team Report on Fiberight – 2/4/15 (continued)		
Doc.- Pg #-§#-Line #	Quotation – Point of Inquiry / Interest / Concern	Technical Analysis - Comments
<b>III. Final Products, By-products and Viable Market Concerns not adequately ID'ed as Risk Factor for Fiberight Project</b>		
SUM-#1-§6-#1-3	“odor issues limited to the front-end....are relatively odor free”	Only odor comment in SUM/PPS- no data! FBRI afterthought? Off-gassing likely in other process areas from spoilage
SUM-#7-§3-#7	“Appendix D cautions having sugars as an end product”	Significant issue that Fiberight proposes to convert some to additional biogas production – how much/cost, how often, etc.
SUM-#7-§4-#6-8	“With elimination of ethanol .... from Maine project, now there is no product with current established markets in Maine” .... Significant	Subject matter expert in APP D-#1 §3-#1-3 says “potential of selling cellulosic sugar on the sugar market...led OTFF and DOE to conclude that was not a viable market”
SUM-#7-§4-#9-10	“sugars produced from hydrolysis....is unclear what portion will be used onsite versus sold”	Fiberight now plans to convert some to additional biogas production – how much/cost, how often, economical?
APP A-#8 - §2-#1	“solids.....which is spent fiber with a high lignin content,”	Unclear whether this is Process Engineered Biomass Fuel?
APP E-#2 - §8-#3-5	“impurities build up in the system over time....this liquid waste would require some form of treatment”	Subject matter expert opinion versus view of Fiberight “that there are no by-products that must be managed”
<b>IV. FBRI says no “scale-up issues anticipated” (but scale-up problems can occur with processes are tested only at lab/pilot plant scale)</b>		
APP B - #1- §2 - #2 vs. APP C #1- §2	“The plant can process 50 tpd of municipal solid waste (MSW)” vs “the facility accepts about 5 tons of MSW every two days”	Which plant size is it? 50 TPD is Demo scale plant size according to USDOE, while 2.5 TPD is small/Pilot Plant scale!
APP B - #2- §5 - #1- 2	MSW “achieves about 40% hydrolysis conversion....”	Poor conversion impacts tank sizes/capital expense (CAP-EX)
NA	FBRI didn’t visit commercial plant under construction in Iowa	Visit would likely have provided good scale-up insight to MRC
SUM-#1 - §2 - #4-5	“third party has reported that sugars .... been used to produce ethanol on a laboratory scale”	Big problems typically occur scaling from lab to commercial. But if no “Trashanol” this mitigates problems for MRC project
APP B - #2- §10 - #1	“The pilot plant does not have any fermentation ... capability”	No “Trashanol” planned in Maine so no problem now.
<b>V. Other Process, Engineering Points, Recommendations made by FBRI’s Team but Ignored by MRC</b>		
SUM-#1-§ 7-#3-6	“Maine market analysis is recommended if biomethane, sugars and biomass are planned ... end products from the plant”	FBRI suggests independent market study based on analytical data and real sugar specs (free of impurities, contaminants)
SUM - #9-§ 2-#5-10	“Fiberight ... with ... an independent engineer (Black & Veatch)	MRC should request this study and provide to DEP and public
SUM - #11-§2-#5-10	“recommendation ... an owner rep..., be secured ... to complete or review the Front End Loading (FEL3) process	MRC does not have an “independent representative” to review the project, but is using own consultant G. Aronson.
APP C-#3-§2-#1-5, APP C Figure 12 & 13, APP B #2 § 10 #2	“The chemical plant includes elaborate processes ... to create sugars, encourage fermentation and create ethanol and various other products.... selling ethanol to fuel blenders”	FBRI did not see fermentation tanks and reported that VA pilot plant was not able “to secure an environmental permit to produce ethanol” so what did MRC witness a year earlier?

**KEY To Above Table- Column 1:**

Example: SUM #7 – §1- #6 is the Summary Report by the U Maine FBRI Group, page #7, paragraph 1, line #6  
 PPS = U Maine Power Point Slide Presentation  
 SUM = U Maine FBRI Summary Report - Technology Review of Fiberight Process for MRC  
 APP = Appendix A - E

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