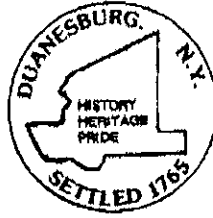


Nelson Gage, Zoning Board Chair  
Dale Warner, Town Planner  
Melissa Deffer, Clerk  
Teresa Bakner, Attorney



Jonathan Lack, Vice Chair Member  
Dianne Grant, Board Member  
Link Pettit, Board Member  
Daniel Boggs, Board Member  
Matthew Ganster, Board Member

**Town of Duanesburg  
Zoning Board of Appeals  
December 21<sup>st</sup>, 2021**

---

Town of Duanesburg is inviting you to a scheduled Zoom meeting.

Topic: Town of Duanesburg's ZBA Meeting

Time: This is a recurring meeting Meet anytime

**Join Zoom Meeting**

<https://us02web.zoom.us/j/86499746075>

**Meeting ID:** 864 9974 6075

**Passcode:** 130214

**Dial in by Phone:** 1-646-558-8656

**Meeting ID:** 864 9974 6075

**Passcode:** 130214

**INTRODUCTION BY CHAIRPERSON NELSON GAGE:**

**OPEN FORUM**

**PUBLIC HEARINGS:**

**#21-09 Kirker, Richard:** SBL#65.300-1-31.131, (R-2) located on 696 Gage Rd is seeking a 16.54 variance to meet the requirements for a flag lot under section 3.5.93(B); section 14.5.2(B) of the Town of Duanesburg Zoning Ordinance.

Approved: Yes \_\_\_\_\_ No: \_\_\_\_\_

Comments: \_\_\_\_\_

---

**#21-10 Patterson, Geoffrey:** SBL# 34.00-2-8.2, (R-2) located on 951 Batter St is seeking a side yard variance under section 14.5.2(8); 8.6(2); 3.5.2 of the Town of Duanesburg Zoning Ordinance.

Approved: Yes \_\_\_\_\_ No: \_\_\_\_\_

Comments: \_\_\_\_\_

---

**OLD BUSINESS:**

None

**NEW BUSINESS:**

None

**ZONING BOARD MEETING MINUTES:**

November 16<sup>th</sup>, 2021

October 19<sup>th</sup>, 2021

Nelson Gage, Zoning Board Chair  
Dale Warner, Town Planner  
Melissa Deffer, Clerk  
Terresa Bakner, Attorney



Jonathan Lack, Vice Chair Member  
Dianne Grant, Board Member  
Link Pettit, Board Member  
Daniel Boggs, Board Member  
Matthew Ganster, Board Member

Approved: Yes \_\_\_\_\_ No: \_\_\_\_\_

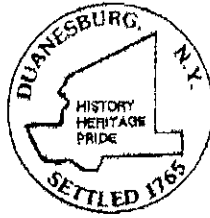
Comments: \_\_\_\_\_

---

## **ADJOURNMENT**

**AGENDA ITEMS MAY BE ADDED, DELETED, OR ORDER CHANGED WITHOUT NOTICE**

Nelson Gage, Zoning Board Chair  
Dale Warner, Town Planner  
Melissa Deffer, Clerk  
Terresa Bakner, Attorney



Jonathan Lack, Vice Chair Member  
Dianne Grant, Board Member  
Link Pettit, Board Member  
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**PUBLIC HEARING  
LEGAL NOTICE  
FOR THE  
TOWN OF DUANESBURG  
ZONING BOARD OF APPEALS**

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OF DUANESBURG, 5853 WESTERN TURNPIKE, ON DECEMBER 21<sup>st</sup>, 2021, AT  
7:00 PM FOR THE PURPOSE OF HEARING ALL PERSONS INTERESTED IN THE  
APPLICATION OF:

**#21-09 Kirker, Richard:** SBL#65.00-1-31.131, (R-2) located on 696 Gage Rd is  
seeking a 16.54-foot variance to meet the requirements for a flag lot under section  
3.5.93(B); section 14.5.2(B) of the Town of Duanesburg Zoning Ordinance.

APPLICATION INFORMATION IS AVAILABLE DURING BUSINESS HOURS. PLEASE  
CONTACT:

Melissa Deffer Building, Planning and Zoning Clerk

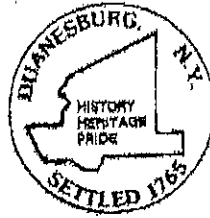
P# 518-895-2040

EMAIL: [Mdeffer@duanesburg.net](mailto:Mdeffer@duanesburg.net)

BY ORDER OF THE  
TOWN OF  
DUANESBURG ZONING BOARD OF APPEALS  
CHAIRPERSON

Town Hall • 5853 Western Turnpike • Duanesburg, NY 12056 • (518) 895-8920

Nelson Gage, Zoning Board Chair  
Dale Warner, Town Planner  
Melissa Deffer, Clerk  
Teresa Bakner, Attorney



Jonathan Lack, Vice Chair Member  
Dianne Grant, Board Member  
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**PUBLIC HEARING  
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APPLICATION INFORMATION IS AVAILABLE DURING BUSINESS HOURS. PLEASE  
CONTACT:

Melissa Deffer Building, Planning and Zoning Clerk

P# 518-895-2040

EMAIL: [Mdeffer@duanesburg.net](mailto:Mdeffer@duanesburg.net)

BY ORDER OF THE  
TOWN OF  
DUANESBURG ZONING BOARD OF APPEALS  
CHAIRPERSON

Town Hall • 5853 Western Turnpike • Duanesburg, NY 12056 • (518) 895-8920

VARIANCE APPLICATION  
TOWN OF DUANESBURG  
ZONING BOARD OF APPEALS

Revised 03/5/15

Date: October 4, 2021 Zoning District A-R Type of Variance  
 Use Variance  Area Variance  
SBL# 65.00-1-31.131 Phone #: \_\_\_\_\_

Applicant's Name: Richard E. Kirker

Applicant's Address: 6 Independence Trail  
Ballston Spa, NY 12020

Property Owner Name(if different): Same

Property Address (if different): 696 Gage Road, Delanson, NY 12093

Property Owner's Signature \_\_\_\_\_  
(Signature of owner indicates they have reviewed the proposal and give their permission)

Proposal: (Brief description of request)  
Subdivision of parcel into 2 lots, one with 60 feet of frontage on Gage Road, the other with only 43.46 feet of frontage needs a frontage variance.

A copy of this notarized application and the accompanying information must be submitted to the Planning and Zoning Department for approval before being placed on the ZBA agenda. Twelve (15) copies of this application must be reviewed and filed at least 10 days prior to the next ZBA meeting.

**REQUIRED INFORMATION:**

- Copy of the property deed
- Location map showing the location of the property with
  - A) Name of applicant and SBL#
  - B) North arrow; Street and if applicable the lake shore
  - C) Adjoining property owners names with location of wells and septic systems within 100ft of the adjoining property boundaries
- Property map to scale
  - A) Name of applicant and SBL#
  - B) North arrow; Location of any structures currently on the property with dimensions of the structures and distances to the property boundaries
  - C) Location of proposed structure, dimensions and intended use; Distances from the proposed structure to the property boundaries
  - D) Location of well and septic system; Any easements or right of ways and any other geographic or environmental characteristics of the property which may have a bearing on the Board's decision

I certify that all the information submitted is true and accurate to the best of my knowledge.

[Signature]  
Applicant Date 10/5/2021

**GIA L. NEALON**  
Notary Public, State of New York  
Registration #01NE6387062  
Qualified in Schenectady County  
Commission Expires Nov. 13, 2021

State of New York, county of Schenectady sworn this 5th day of October 2021.

Notary Public  
[Signature]

\*\*\*\*\* (For Office use only) \*\*\*\*\*

Reviewed by \_\_\_\_\_ Date \_\_\_\_\_  
Fee \_\_\_\_\_ Date \_\_\_\_\_ Check# \_\_\_\_\_ Rec'd By \_\_\_\_\_  
Hearing Date \_\_\_\_\_ Approved: YES NO Approval Date \_\_\_\_\_

Conditions of approval: A permit must be obtained within 6 months of approval of this application and all other aspects of the Zoning Ordinance must be followed or the approval becomes null and void.

Other Conditions include: \_\_\_\_\_

Authorized Signature \_\_\_\_\_ Date \_\_\_\_\_  
(ZBA Chairperson)

NOTICE OF DETERMINATION  
of the Town of Duaneburg

Date of Determination 10/12/21

Application of Richard + Tracy Kirkner <sup>biachnie</sup> (Joe ABBERY.) under section  
3.5.93 of the (Village of Delanson/ Town of Duaneburg)  
Zoning Ordinance.

Applicant Richard + Tracy Kirkner  
Address 6 Independence Trail  
Ballston, Spa 12020

696 Gage Rd.

Phone \_\_\_\_\_ Zoning District R-2 SBL# 65.00 - 1-31.131

Description of Project: Divide an existing 22 Acre parcel into two portions  
seek a variance of 16.54' to meet the requirements for a Flag lot

Determination:  
Flag lot requiring 60' at the road

Reason supporting determination:  
Town of Duaneburg Zoning Ordinance adopted 6/11/15  
section 3.5.93 (B), section 14.5.2 (B)

Action: Refer to ZBA for the purpose of Area Variance

Code Enforcement Officer: [Signature]

THIS IS A LEGAL INSTRUMENT AND SHOULD BE EXECUTED UNDER SUPERVISION OF AN ATTORNEY

**WARRANTY DEED**

THIS INDENTURE, Made the 25<sup>th</sup> Day of May, Two Thousand Twenty One,

**BETWEEN**

**WILLIAM E. KENFIELD, JR.**, residing at 626 Gage Road, Delanson, New York 12053,

party of the first part, and

**RICHARD E. KIRKER, JR., and TRACY A. KIRKER**, husband and wife, both residing at 6 Independence Trail, Ballston Spa, New York 12020

parties of the second part,

**WITNESSETH**, that the party of the first part, in consideration of ONE (\$1.00) DOLLAR, lawful money of the United States, and other good and valuable consideration, paid by the parties of the second part, does hereby grant and release unto the parties of the second part, their heirs or successors and assigns forever,

**See Schedule "A"**

**BEING A PORTION OF THE SAME PREMISES** conveyed to the party of the first part by Warranty Deed dated October 14, 2002, and recorded in the Schenectady County Clerk's Office on October 17, 2002, in Book 1635 of Deeds at Page 487.

**AND** the party of the first, in compliance with Section 13 of the Lien Law, covenants, that the party of the first part will receive the consideration for this conveyance, and will hold the right to receive such consideration as a trust fund, to be applied first for the purpose of paying the cost of the improvement and will apply the same first to the payment of the cost of the improvement, before using any part of the total of the same, for any other purpose.

**TOGETHER** with the appurtenances and all the estate and rights of the grantor in and to said premises.

**TO HAVE AND TO HOLD** the premises herein granted unto the grantees, their heirs or successors and assigns of the grantees forever.

**AND** the grantor covenants as follows:

**FIRST**, that the grantees shall quietly enjoy the said premises;

**SECOND**, that the grantor will forever Warrant the title to said premises;

**RECEIVED**  
OCT 12 2021

**ADDITIONAL**

This deed is subject to the trust provisions of Section 13 of the Lien Law. The words "grantor" and "grantee" shall be construed to read in the plural whenever the sense of this deed so requires.


IN WITNESS WHEREOF, the grantor has hereunto set his hand and seal the day and year first above written.

IN PRESENCE OF

William E. Kenfield, Jr. L.S.  
WILLIAM E. KENFIELD, JR.

STATE OF NEW YORK )  
COUNTY OF SCHENECTADY )ss.:

On May 25, 2021, before me, a Notary Public in and for said State, the undersigned, personally appeared **William E. Kenfield, Jr.**, personally known to me or proved to me on the basis of satisfactory evidence be the individual whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity, and that by his signature on the instrument, the individual or the person upon behalf of which the individual acted, executed the instrument.

Paul M. Callahan  
Notary Public  
  
**PAUL M. CALLAHAN**  
NOTARY PUBLIC, STATE OF NEW YORK  
No. 4822813  
QUALIFIED IN SCHENECTADY COUNTY  
COMMISSION EXPIRES FEBRUARY 28, 2022

R+R

**PAUL M. CALLAHAN, ESQ.**  
4886 WESTERN TURNPIKE  
DUANESBURG, NEW YORK 12056

RECEIVED  
OCT 12 2021

ORIGINAL



SCHEDULE "A"

AUGUST 30, 2007  
MAP NO.: F6/51/07

LOT 1

A PORTION OF THE LANDS OF WILLIAM E. KENFIELD, JR. RECORDED IN  
LIBER 1635 OF DEEDS AT PAGE 487

All that certain piece or parcel of land situate, lying and being in the Town of  
Duanesburg, County of Schenectady, State of New York bounded and described as  
follows:

....BEGINNING at an iron pin found set in the ground on the westerly bounds of Gage  
Road in distance 25' perpendicular from the centerline thereof, said iron pin being at the  
southeasterly corner of the lands herein described and at a northeasterly corner of the  
lands of Eric R. Brown (L. 1599/P.92); SAID FOUND IRON PIN being the POINT OF  
BEGINNING of the lands herein described; thence leaving said found iron pin on the  
following three (3) bearings and distances along the said lands of Eric R. Brown:

NORTH 83-11-00 WEST 767.60 FEET to an iron pin tagged "R.D.Snyder" found set  
in a stone wall intersection,

NORTH 80-59-25 WEST 595.13 FEET along the centerline of a stone wall to a point  
at a stone wall intersection, and

NORTH 78-58-05 WEST 673.61 FEET along the centerline of a stone wall to an iron  
pin found set in a stone wall intersection; thence leaving said found iron pin

NORTH 09-10-45 EAST 466.65 FEET along the lands of Richard A. Romer  
(L.1488/P.227) being along the centerline of a stone wall to an iron pin found set in a  
stone wall intersection; thence leaving said found iron pin on the following two (2)  
bearings and distances along the lands of William E. Kenfield, Jr. (L.1602/P.251) being  
along the centerline of a stone wall:

SOUTH 80-59-05 EAST 664.67 FEET to a point at a stone wall intersection, and

SOUTH 80-48-40 EAST 681.75 FEET to an iron pin found set in a stone wall  
intersection; thence leaving said found iron pin

SOUTH 17-17-45 WEST 65.61 FEET along the lands of Ginger C. Clark  
(L.1165/P.63) to an iron pin found set in the ground; thence leaving said found iron pin  
on the following two (2) bearings and distances through the lands of William E. Kenfield,  
Jr. (L.1635/P.487):

(continued)

RECEIVED  
OCT 12 2021

ORIGINAL

SCHEDULE "A" - PAGE 2

LOT 1

PAGE 2

SOUTH 18-00-25 WEST 323.00 FEET along the centerline of a stone wall to an iron pin set in the said wall, and

SOUTH 83-11-00 EAST 746.87 FEET to an iron pin set in the ground on the bounds of the said Gage Road in distance 25' perpendicular from the centerline thereof; thence leaving said iron pin

SOUTH 08-20-20 WEST 103.49 FEET along the bounds of Gage Road to the point or place of beginning containing 16.34 ACRES OF LAND be the same more or less according to a survey run in the field during August 2007 by Rudolph D. Snyder, L.S., P.C. of Middleburgh, New York 12122. All bearings are referenced to Magnetic North 1965.

Together with all rights and privileges to the centerline of Gage Road.

Excepting and reserving all rights and privileges granted to utility companies.

All iron pins being 5/8" x 3/4" re-rod with yellow caps tagged "R.D.Snyder".

RECEIVED  
OCT 12 2021  
ORIGINAL

Nelson Gage, Zoning Board Chair  
Dale Warner, Town Planner  
Melissa Deffer, Clerk  
Terresa Bakner, Attorney



Jonathan Lack, Vice Chair Member  
Dianne Grant, Board Member  
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**PUBLIC HEARING  
LEGAL NOTICE  
FOR THE  
TOWN OF DUANESBURG  
ZONING BOARD OF APPEALS**

---

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**#21-10 Patterson, Geoffrey:** SBL# 34.00-2-8.2, (R-2) located on 951 Batter St is seeking a side yard variance under section 14.5.2(8); 8.6(2); 3.5.2 of the Town of Duanesburg Zoning Ordinance.

APPLICATION INFORMATION IS AVAILABLE DURING BUSINESS HOURS. PLEASE  
CONTACT:

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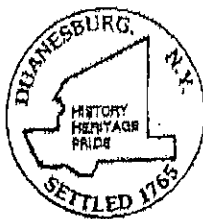
P# 518-895-2040

EMAIL: [Mdeffer@duanesburg.net](mailto:Mdeffer@duanesburg.net)

BY ORDER OF THE  
TOWN OF  
DUANESBURG ZONING BOARD OF APPEALS  
CHAIRPERSON

Town Hall • 5853 Western Turnpike • Duanesburg, NY 12056 • (518) 895-8920

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EMAIL: [Mdeffer@duanesburg.net](mailto:Mdeffer@duanesburg.net)

BY ORDER OF THE  
TOWN OF  
DUANESBURG ZONING BOARD OF APPEALS  
CHAIRPERSON

Town Hall • 5853 Western Turnpike • Duanesburg, NY 12056 • (518) 895-8920

VARIANCE APPLICATION  
TOWN OF DUANESBURG  
ZONING BOARD OF APPEALS

Revised 03/5/15

Date: 10-7-01 Zoning District R-2

Type of Variance  
 Use Variance  Area Variance

SBL# 34.00-2-8.2

Phone #: \_\_\_\_\_

Applicant's Name: Geoffrey Patterson

Applicant's Address: 951 Batten St.  
Pattersonville, NY, 12137

Property Owner Name(if different): \_\_\_\_\_

Property Address (if different): \_\_\_\_\_

Property Owner's Signature [Signature]  
(Signature of owner indicates they have reviewed the proposal and give their permission)

Proposal: (Brief description of request)

Build pole barn 20' from property line - 34.00-2-8.3 (owned by me)  
(Dog Storage)

A copy of this notarized application and the accompanying information must be submitted to the Planning and Zoning Department for approval before being placed on the ZBA agenda. Twelve (12) copies of this application must be reviewed and filed at least 10 days prior to the next ZBA meeting.

**REQUIRED INFORMATION:**

- Copy of the property deed
- Location map showing the location of the property with
  - A) Name of applicant and SBL#
  - B) North arrow; Street and if applicable the lake shore
  - C) Adjoining property owners names with location of wells and septic systems within 100ft of the adjoining property boundaries
- Property map to scale
  - A) Name of applicant and SBL#
  - B) North arrow; Location of any structures currently on the property with dimensions of the structures and distances to the property boundaries
  - C) Location of proposed structure, dimensions and intended use; Distances from the proposed structure to the property boundaries
  - D) Location of well and septic system; Any easements or right of ways and any other geographic or environmental characteristics of the property which may have a bearing on the Board's decision

I certify that all the information submitted is true and accurate to the best of my knowledge.

Applicant \_\_\_\_\_ Date \_\_\_\_\_

State of New York, county of Schenectady sworn this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_, Notary Public

\*\*\*\*\* (For Office use only) \*\*\*\*\*

Reviewed by \_\_\_\_\_ Date \_\_\_\_\_  
 Fee \_\_\_\_\_ Date \_\_\_\_\_ Check# \_\_\_\_\_ Rec'd By \_\_\_\_\_  
 Hearing Date \_\_\_\_\_ Approved: YES NO Approval Date \_\_\_\_\_

Conditions of approval: A permit must be obtained within 6 months of approval of this application and all other aspects of the zoning Ordinance must be followed or the approval becomes null and void.

Other Conditions include: \_\_\_\_\_

Authorized Signature \_\_\_\_\_ Date \_\_\_\_\_  
(ZBA Chairperson)

Agricultural Data Statement

Date: \_\_\_\_\_

Instructions: Per § 305-a of the New York State Agriculture and Markets Law, any application for a special use permit, site plan approval, use variance or a subdivision approval requiring municipal review and approval would occur on property within a New York State Certified Agricultural District containing a farm operation or property with boundaries within 500 feet of a farm operation located in an Agricultural District shall include an Agricultural Data Statement.

Applicant	Owner if Different from Applicant
Name: <u>Georgia Patterson</u> Address: <u>951 Butler St</u> <u>Pattersonville, NY 12137</u>	Name: _____ _____ _____

1. Type of Application: Special Use Permit; Site Plan Approval; Use Variance; Area Variance; Subdivision Approval (circle one or more)
2. Description of proposed project:  
\_\_\_\_\_  
\_\_\_\_\_

3. Location of project: Address: 951 Butler St Pattersonville NY 12137  
Tax Map Number (TMP) 34.00-2-8,2

4. Is this parcel within an Agricultural District? YES NO (Check with your local assessor if you do not know.)
5. If YES, Agricultural District Number \_\_\_\_\_
6. Is this parcel actively farmed? YES NO
7. List all farm operations within 500 feet of your parcel. Attach additional sheet if necessary.

#334 NAME: <u>Houghton</u> ADDRESS: _____ Is this parcel actively farmed? <u>YES</u> NO	#20 + #21 NAME: <u>Clifford</u> ADDRESS: _____ Is this parcel actively farmed? <u>YES</u> NO
NAME: _____ ADDRESS: _____ Is this parcel actively farmed? YES NO	NAME: _____ ADDRESS: _____ Is this parcel actively farmed? YES NO

\_\_\_\_\_  
Signature of Applicant

\_\_\_\_\_  
Signature of Owner (if other than applicant)

Reviewed by: Dale R. Warner  
Dale R. Warner

9/24/21  
Date

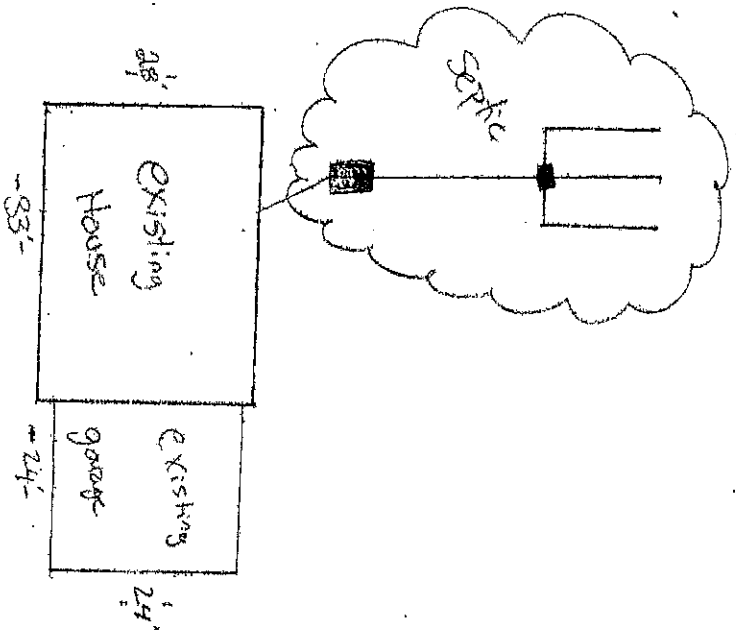
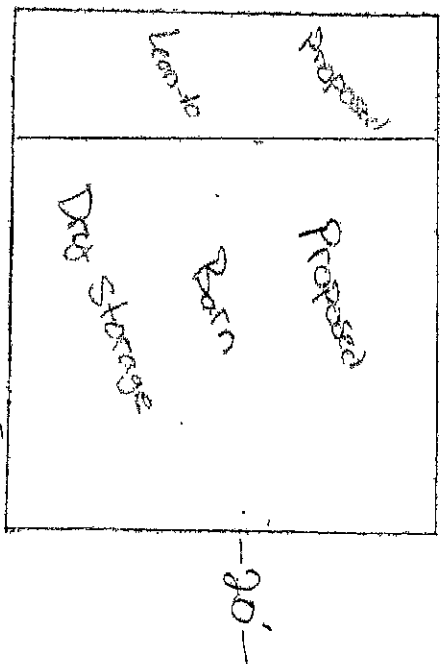
Revised 4/4/17

**FARM NOTE**

Prospective residents should be aware that farm operations may generate dust, odor, smoke, noise, vibration and other conditions that may be objectionable to nearby properties. Local governments shall not unreasonably restrict or regulate farm operations within State Certified Agricultural Districts unless it can be shown that the public health or safety is threatened.

**NOTE TO REFERRAL AGENCY:** County Planning Board review is required. A copy of the Agricultural Data Statement must be submitted along with the referral to the County Planning Department.

**ORIGINAL**  
**RECEIVED**  
OCT 12 2021



**RECEIVED**  
 OCT 12 2021

**ORIGINAL**

Geoffrey Rafterman

957 Rafter St,

24 00-2-83



60' to edge of road

90' to edge of road

60'

90'

Stamps

**THIS INDENTURE** made this 30<sup>th</sup> day of March, 2012,

**BETWEEN:**

**RICHARD RUNNELS**, residing at 176 Batter Street, Pattersonville, New York 12137, party of the first part, and

**GEOFFREY PATTERSON**, residing at 1793 Hermance Road, Galway, New York 12074, party of the second part,

WITNESSETH: that the party of the first part, in consideration of One and 00/100 (\$1.00) Dollars, lawful money of the United States, and other good and valuable consideration paid by the party of the second part does hereby grant and release unto the party of the second part, his heirs and assigns forever,

ALL THAT TRACT OR PARCEL OF LAND, situate in the Town of Duaneburg, County of Schenectady and State of New York along the Southerly side of Batter Street, that portion which lies Westerly of the Lake Connection Road and Easterly of the Duaneburg Churches Road and more particularly bounded and described as follows:

BEGINNING at the point, said point being Westerly a distance of 712 feet more or less, along the Southerly side of Batter Street from the centerline of Lake Connection Road;

THENCE, running S 74°-11'-16"W a distance of 89.45 feet and S-71°-00'-54"-W a distance of 110.55 feet along the southerly side of Batter Street to a point;

THENCE, running S-10°-59'-06"-E a distance of 467.40 feet along the division line between the lands herein described on the East and other lands now or formerly of John Szwetkowski on the West, being along a stone wall, to a point;

THENCE, running N-82°-E a distance of 198.88 feet along the division line between the lands herein described on the North and lands now or formerly of Wolny on the South, being along the Great Lot Line between Lot No. 315 on the south and Lot No. 322 on the North and being along a stonewall, to a point;

THENCE running N-10°-59'-06"-W a distance of 500.67 feet along the division line between the lands herein described on the West and other lands of John Szwetkowski on the East, to a point, said point being on the Southerly side of Batter Street and being the point or place of beginning.

Being the same premises as conveyed to the party of the first part by Warranty Deed, dated February 22, 2001 from John W. Bard and recorded in the Schenectady County Clerk's Office on December 30, 2003 in Book 1668 of Deeds at Page 153.

RECEIVED  
OCT 12 2021

ORIGINAL



Subject to any and all enforceable covenants, conditions, easements and restrictions of record affecting said premises.

**TOGETHER** with the appurtenances and all the estate and rights of the party of the first part in and to said premises.

**TO HAVE AND TO HOLD** the premises herein granted unto the party of the second part, his heirs,

**AND** said party of the first part does covenant as follows:

**FIRST**, That the party of the second part shall quietly enjoy the said premises;


**SECOND**, That said party of the first part will forever Warrant the title to said premises.

**THIRD**, That in Compliance with Section 13 of the Lien Law, the grantor will receive the consideration for this conveyance and will hold the right to receive such consideration as a trust fund to be applied first for the purpose of paying the cost of the improvement and will apply the same first to the payment of the cost of the improvement before using any part of the total of the same for any other purpose.

**IN WITNESS WHEREOF**, the party of the first part has hereunto set his hand and seal the day and year first above written.


IN PRESENCE OF

  
\_\_\_\_\_  
RICHARD RUNNELS

**RECEIVED**  
OCT 12 2021  
 ORIGINAL

STATE OF NEW YORK )  
COUNTY OF ALBANY ) ss.:

On this 30<sup>th</sup> day of March, 2012, before me, the undersigned, personally appeared RICHARD RUNNELS, personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity, and that by his signature on the instrument, the individual, or the person on behalf of which the individual acted, executed the instrument.

  
Notary Public

Record and Return

KARYLL L. BALLE  
Notary Public, State of New York  
Qualified in Schenectady County  
No. 4778886  
My Commission Expires Aug. 31, 2014

RECEIVED  
OCT 12 2021

ORIGINAT

Nelson Gage, Zoning Board Chair  
Dale Warner, Town Planner  
Melissa Deffer, Clerk  
Teresa Bakner, Board Attorney



TOWN OF DUANESBURG  
SCHENECTADY COUNTY

Jonathan Lack, Vice Chairperson  
Dianne Grant, Board Member  
Link Pettit, Board Member  
Daniel Boggs, Board Member  
Matthew Ganster, Board Member

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OCT 21 2021

TOWN OF DUANESBURG  
TOWN CLERK

Town of Duanesburg  
Zoning Board Minutes  
October 19, 2021  
Draft Copy

**MEMBERS PRESENT:** Nelson Gage Chairman, Jonathan Lack Vice Chairman, Daniel Boggs, Matthew Ganster, Link Pettit. Also attending Clerk Melissa Deffer.

**INTRODUCTION:**

Nelson Gage opened the meeting at 7:00 pm. Gage welcomed everyone to tonight's meeting.

**OPEN FORUM:**

Nelson Gage opened the open forum.  
Lynne Bruning located at 13388 Duanesburg Rd (Please see attachment)  
Nelson Gage closed the open forum.

**PUBLIC HEARINGS:**

**#21-08 Russell, Richard:** SBL# 35.06-5-38, (R-1) located on Spring Rd is seeking a 32' west side yard variance and a 18' East side yard variance to construct a 24X28 garage under section 6.6(2); 14.5.2(B) of the Town of Duanesburg Zoning Ordinance.

Mr. Russell gave his presentation to the public

Nelson Gage opened the public hearing for the **#21-08 Russell, Richard** application at 7:11 pm.

John Buehler located at 215 Spring Rd would like to know the exact location on where Richard is looking to put the garage, and why is it not centered in the property instead of being 8 feet from his side of the property line?

Richard explained that there is what looks like an old driveway on the right side of the property that he would like to keep as the driveway onto the property and he will be able to pull into the garage with parking space in front. The back side of the garage will be facing the Buehler property,

Teri Kennedy located at 240 Spring Rd explained that her and her husband have always had problems with the previous neighbors and her husband is to upset to come to the meeting. Mrs. Kennedy explained that when they bought their property it took them years to bring stone in and

make that easement usable and now that it is completed everyone wants to use what they put in. Mrs. Kennedy would like people to ask permission from them to use the easement if they must, she doesn't mind but she would only like property owners not outsiders.

Nelson Gage closed the public hearing for the **#21-08 Russell, Richard** application at 7:28 pm.

**Gage/Lack** made a motion to grant **#21-08 Russell, Richard**, of 35 Sunset Lane Schenectady for his property on Spring Rd SBL#35.06-5-38, a Special Use Permit to construct a private garage and an east side yard variance of 18' and a west side yard setback variance of 32' on a preexisting undersized lot to construct a 24X28 one story detached garage per findings of section 14.5.2(B) providing a building permit be obtained within 6 months and all other aspects of the ordinance be followed.

Gage aye, Lack aye, Ganster aye, Pettit aye, Boggs aye. **Approved.**

### **OLD BUSINESS:**

None

### **New Business:**

**#21-09 Kirker, Richard:** SBL#65.300-1-31.131, (R-2) located on 696 Gage Rd is seeking a 16.54 variance to meet the requirements for a flag lot under section 3.5.93(B); section 14.5.2(B) of the Town of Duanesburg Zoning Ordinance. Joseph J. Bianchine, P.E from ABD Engineering represented Mr. Kirker. Richard recently just purchased from his uncle 696 Gage Rd it is roughly a little more than 16 acres. He would like to subdivide the land into 2 parcels and build his on 10 acres a home and give the other 6 acres or so to his daughter to build her house on. The lot has a 750' strip and then widens out in the back. There is only 103' of road frontage so Mr. Bianchine set it up so that a 60' strip that would go back to his daughters and then a 43' strip would be his. Joe Explained that he would need a 16.54 variance before he can start the subdivision process. There is already a Stone driveway put in that will need to be extend. The parcel is currently an overgrown field with no existing structures on the property.

**Gage/Ganster** made a motion that the **#21-09 Kirker, Richard** application is and exempt Type II action pursuant to Title 6 NYCRR Section 671.5(c)(12) or (13).

**No further action pursuant to SEQRA is required.**

Gage aye, Ganster aye, Pettit aye, Boggs aye, Lack aye. **Approved.**

**Lack/Boggs** made a motion to set a public hearing for November 16<sup>th</sup>, 2021 at 7pm, or there about for the application of **#21-09 Kirker, Richard:** SBL#65.300-1-31.131, (R-2) located on 696 Gage Rd for a 16.54 variance to meet the requirements for a flag lot under section 3.5.93(B); section 14.5.2(B) of the Town of Duanesburg Zoning Ordinance.

Lack aye, Boggs aye, Gage aye, Ganster aye, Pettit aye. **Approved.**

**#21-10 Patterson, Geoffrey:** SBL# 34.00-2-8.2, (R-2) located on 951 Batter St is seeking a side yard variance under section 14.5.2(8); 8.6(2); 3.5.2 of the Town of Duanesburg Zoning Ordinance. Geoffrey explained that he currently owns all the vacant land surrounding the two-acre parcel that his house is on. He bought his house 8 years ago and it was built in the 50s-60's. Geoffrey would like to build a 48X56 pole barn with a 16' lean-to off the side so he

can store his heavy equipment in. the building will be 31ft' high to the peak and will match the height of his house.

**Gage/Lack** made a motion that the **#21-10 Patterson, Geoffrey** application is and exempt Type II action pursuant to Title 6 NYCRR Section 671.5(c)(12) or (13).

**No further action pursuant to SEQRA is required.**

Gage aye, Lack aye, Ganster aye, Pettit aye, Boggs aye. **Approved.**

**Lack/Ganster** made a motion to set a public hearing for November 16<sup>th</sup>, 2021 at 7pm, or there about for the application of **#21-10 Patterson, Geoffrey**: SBL# 34.00-2-8.2, (R-2) located on 951 Batter for a 20' west side yard variance under section 8.6(2) of the Town of Duanesburg Zoning Ordinance.

Lack aye, Ganster aye, Pettit aye, Boggs aye, Gage. **Approved**

**#21-11 Ultimate Wisby Wash**: SBL# 53.00-1-29.21, (C-1) located on 9938 Western Turnpike is seeking an area variance of 16' to reduce side yard to 24 ft' under section 11.6(2) side yard; section 14.5.2(B) (1-5) of the Town of Duanesburg Zoning Ordinance. Spiro Kagas is asking for a 16' west side yard variance to construct a 3<sup>rd</sup> bay to his carwash. Mr. Kagas contacted and had his neighbor, and a letter was signed that states William Snyder III is okay with the adding of a third bay. Spiro currently has 2 bays one for cars and small trucks and the second big bay is for trailers and larger vehicles. Because for the most part the car wash is self-serve there are times that cars use the larger bay when the smaller bay is being used and the bigger vehicles tend to leave because they can not use the smaller bay. The driveway will need to be extended a little bit.

**Gage/Lack** made a motion that the **#21-11 Ultimate Wisby Wash** application is and exempt Type II action pursuant to Title 6 NYCRR Section 671.5(c)(12) or (13).

**No further action pursuant to SEQRA is required.**

Gage aye, Lack aye, Ganster aye, Pettit aye, Boggs aye. **Approved.**

**Lack/Ganster** made a motion to set a public hearing for November 16<sup>th</sup>, 2021 at 7pm, or there about for the application of **#21-11 Ultimate Wisby Wash**: SBL# 53.00-1-29.21, (C-1) located on 9938 Western Turnpike is seeking a area variance of 16' to reduce side yard to 24 ft' under section 11.6(2) side yard; section 14.5.2(B) (1-5) of the Town of Duanesburg Zoning Ordinance.

Lack aye, Ganster aye, Pettit aye, Boggs aye, Gage. **Approved.**

#### **OTHER:**

Chairman Gage informed the Board Members of the Sexual Harassment training that needs to be completed along with the yearly training,

#### **MINUTES APPROVAL:**

**Lack/Pettit** made a motion to approve the September 21<sup>st</sup>, 2021, Zoning Board minutes with one minor correction.

Lack aye, Pettit aye, Ganster aye, Gage aye, Boggs aye. **Approved.**

**ADJOURNMENT:**

**Pettit/Boggs** made a motion to adjourn at 8:48 pm.

Pettit aye, Boggs aye, Gage aye, Lack aye, Ganster aye. **Approved.**

PO Box 106  
Quaker Street, NY 12141

Nelson Gage, Chair  
Zoning Board  
Town of Duanesburg  
5853 Western Turnpike  
Duanesburg, NY 12056

RE: Solar Law and Zoning

October 19, 2021

Dear Nelson Gage and the Zoning Board,

Please include my public comment and supporting documents in the Zoning Board's official record of tonight's meeting minutes as posted on the town's website.

September 23, 2021 the Town Board held a public hearing and adopted Local Law 2 of 2021 "2021 Temporary Moratorium Law on Major Solar Energy Systems including Battery Energy Storage Systems." This is the third moratorium on solar development since November 2019. It is the first moratorium on battery storage.

I urge the Zoning Board members to be actively involved in the development of an updated solar law and a new battery energy storage law. Our 2021 Comprehensive Plan states "We are committed to sustaining our valuable economic and natural resources, particularly agricultural land use, open spaces, natural habitats, and fresh watersheds. We support thoughtful growth and development that enable affordable taxes, enhances the character of commercial and residential zones..."

Utility scale solar industrializes our rural residential and agricultural zoned areas. In 2019 the developers of Oak Hill Solar obtained a Special Use Permit for a 8.5 feet tall array. In 2021 the second owner and contractor wants a building permit for an array that is almost double in height at 14.5 feet tall. They also want to add four 53 feet long containers of battery energy storage, back up generators, increased roads and other changes. Utility scale solar facilities are power plants and should be sited within commercial or industrial zoned areas.

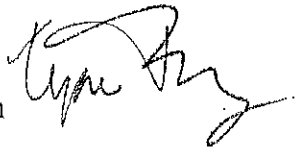
Tonight I would like to share with the Zoning Board a letter and supporting research that I submitted to the Planning Board concerning PFAS, Solar Panels and the Precautionary Principle.

There is growing evidence that solar panel manufactures use PFAS substances in the anti-reflective and ant-soil coatings applied to the surface of commercial solar panels. Studies have shown that these coatings may degrade as soon as two weeks. The possible contamination of soil, ground and drinking water supplies is yet one more reason that zoning board should be actively involved in the siting of utility scale solar power plants and battery energy storage systems.

I've brought copies of my October 19, 2021 submission to the planning board for your review. Please, I urge you to be active in the review of the solar law and development of a new battery energy storage law. Please do not hesitate to contact me with any questions or concerns about solar and battery storage.

Thank you for your time and consideration.

Respectfully,  
Lynne Bruning  
720-272-0956  
lynnebruning@gmail.com

A handwritten signature in black ink, appearing to read 'Lynne Bruning', written over the typed name and contact information.

Enc: October 19, 2021 Letter and Research Referencees Bruning to Planning Board  
October 12, 2021 Cover letter and Report Saving Greene to Planning Board



PO Box 160  
Quaker Street, NY 12141

Supervisor Tidball and the Town Board  
Jeffery Schmitt and the Planning Board  
Town of Duanesburg  
5853 Western Turnpike  
Duanesburg, NY 12056

Transmitted via email: town clerk jhowe@duanesburg.net, rtidball@duanesburg.net,  
bwenzel@duanesburg.net, mdeffer@duanesburg.net and jschmitt@duanesburg.net

October 19, 2021

RE: Precautionary Principle for PFAS at Oak Hill Solar 1, LLC and Oak Hill Solar 2, LLC

Dear Chairman Jeffery Schmitt and the Planning Board,

Saving Greene's October 12, 2021 letter to the Town of Duanesburg Planning Board should have drawn the Town Board and the Planning Board's attention to the very real possibility that PFAS were used in the manufacturing of products that may be used in solar panels and associated equipment at Oak Hill Solar 1, LLC and Oak Hill Solar 2, LLC. The October 15, 2021 letter from PrimeAE to the Town Planner, Dale Warner does not mention PFAS or include any precautionary principle measures, such as soil and ground water testing before and after construction, and annually for the lifetime of the proposed solar and battery storage project.

The purpose of this letter is to once again inform the town and planning boards that the majority of solar panels being installed today are made in Asia, where there may be lack of oversight, lack of environmental restrictions and lack of reporting material and safety data. The Applicant has not provided Material and Data Safety Sheets for the products proposed for Oak Hill solar and battery storage projects. PFAS are known to be used in the manufacture of some solar panels. The Project site soils are all either poorly drained or wetlands and steeply sloped towards residents' only source of drinking water: individual wells drilled adjacent to their homes. The site also drains into a tributary of the Schoharie Creek which feeds into the Hudson River. The site sits all or partially over a principle aquifer.

The Town's lack of due diligence to protect our soil, surface and ground waters, and major aquifer is contrary to our town's Comprehensive Plan. The Town's lack of action flies in the face

of common sense. The Board's lack of oversight concerning possible PFAS contamination of the soil, ground water and aquifer may expose the town to EPA, NYS, and resident litigation, and possibly long term financial devastation. I request that the Town Board and Planning Board perform due diligence and apply the precautionary principle concerning PFAS in the products proposed by the Applicant and that the town require the Applicant to provide escrow so that the town can hire a third-party independent environmental engineering firm to perform pre- and post-construction soil and water testing as well as annual testing for the lifetime of the project.

### **Town of Duanesburg's Comprehensive Plan**

On December 2, 2020, the Town of Duanesburg ("the Town") issued its Comprehensive Plan<sup>1</sup> for the future of Duanesburg. Members of the Town Board and the Town Planning Board set out to update the prior fifteen-year-old plan, which was recognized as outdated. The Town's own Vision Statement in the Comprehensive Plan states: "*We encourage the preservation of our attractive and cultural landscape....We are committed to **sustaining our** valuable economic and **natural resources**, particularly agricultural land use, open spaces, natural habitats, and fresh watersheds. **We support thoughtful growth and development....**" [emphasis added].*

The plans for the Town of Duanesburg to have certain companies install utility scale solar power plants that may also include battery energy storage systems, at least part of which sit atop aquifers, without confirmation, certification, or even assurance of any kind that the products used on the solar plants are PFAS-free contradict the Vision Statement of the Town's Comprehensive Plan. For the reasons explained in this report, the Town's desire to proceed without documentation or warranties of any kind leaves the Town open to future state and federal legal liabilities that will have substantial financial consequences for Duanesburg residents and the Town as a whole.

### **Concerns About Anti-Reflective Coating on Solar Panels**

The purpose of anti-reflective coatings is to increase productivity which in turn increases the investor revenue. The EPA regulates products imported into the United States that contain PFAS under the Toxic Substances Control Act (TSCA).<sup>2</sup> The EPA specifically dictates that goods containing certain PFAS "**...as a surface coating** can not be imported into the United States without EPA review." [emphasis added] The EPA goes on to state in its TSCA Significant New Use

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<sup>1</sup> [https://www.duanesburg.net/sites/g/files/vyhlf4351/f/pages/duanesburg\\_2021\\_comprehensive\\_plan\\_final.pdf](https://www.duanesburg.net/sites/g/files/vyhlf4351/f/pages/duanesburg_2021_comprehensive_plan_final.pdf)

<sup>2</sup> <https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/risk-management-and-polyfluoroalkyl-substances-pfas>

Rule (SNUR)<sup>3</sup> related to PFAS and extraordinarily relevant requirement that directly relates to solar panels:

*“EPA considers any [long-chain PFAS]...from table 1 and table 2 [of the SNUR] containing coating on any surface of any article, whether the coating is applied to the interior facing surface or the exterior facing surface of an article... to be covered by the SNUR.” [emphasis added]*

If the manufacturer of the solar panels that will be used in the Town of Duanesburg have imported materials of any kind (or the panels in their entirety) that contain certain PFAS, they are likely required to disclose the information to the EPA and receive approval from the EPA for the PFAS use in the product. If the manufacturer is required to provide this information to the EPA, then there is absolutely no reason why the Town should not insist that it also receives the same information so that it can make a fully informed decision. The Town must insist on this as part of its due diligence process in deciding whether to approve this project. Failing to do so, or at least failing to require the manufacturer to certify to the lack of PFAS in the solar panels, turns a blind eye to potential PFAS information about these products that may exist in EPA records due to the manufacturer’s disclosure.

### **The Federal PFAS Landscape & Implications To the Town**

President Joe Biden and Vice Present Kamala Harris campaigned on the promise of aggressively addressing environmental concerns and pushing through environmental initiatives for the country. The environment was, in fact, one of the top three campaign promises that the Biden-Harris administration made. Bound within the environmental promises made—to a level never seen by a prior administration—were promises to address PFAS issues:

Instead of making empty promises with no follow-through, Biden will tackle PFAS pollution by designating PFAS as a hazardous substance, setting enforceable limits for PFAS in the Safe Drinking Water Act, prioritizing substitutes through procurement and accelerating toxicity studies and research on PFAS.<sup>4</sup>

Every action taken thus far by the Biden Administration and EPA Administrator Michael Regan shows a demonstrated commitment to follow through with the campaign promises with respect to PFAS.

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<sup>3</sup> <https://www.regulations.gov/document/EPA-HQ-OPPT-2013-0225-0232>

<sup>4</sup> Biden-Harris election campaign website, Environmental Justice section, <https://joebiden.com/environmental-justice-plan/>

## Drinking Water Standards

The EPA is in the final stages of the regulatory process for setting drinking water limits for PFAS under the Safe Drinking Water Act. Just one month into office, Biden's EPA announced final Regulatory Determinations for PFOA and PFOS, which is the final step before the EPA announces an enforceable standard.<sup>5</sup> Just five months later, the EPA issued an announcement that it was broadening its investigation of a drinking water standard for all PFAS as an entire class.<sup>6</sup>

When the EPA sets enforceable PFAS drinking water standards, enforcement actions by the New York Department of Conservation will increase as the state looks to locate sources of PFAS contamination to drinking water sources. In states like New York, which have already set out to identify and remediate PFAS-contaminated sites that are polluting drinking water, the costs are staggering:

- New Hampshire: \$30 million in overall PFAS remediation projects as of 2017, with \$14 million alone spent on one pollution site (the Coakley Landfill)
- Michigan: \$23.2 million at sites across the state
- New York: \$10 million budgeted for one Superfund site in Hoosick Falls, NY to develop alternate drinking water sources for the town due to PFAS
- New York: \$23.5 million settlement from Taconic Plastics Ltd to the Town of Petersburg for PFOA in the town's drinking water.
- Massachusetts: \$2.95 million spent by Town of Barnstable for PFAS remediation of drinking water; \$13 million budgeted by City of Westfield for PFAS remediation<sup>7</sup>

The above are just costs associated with remediation. Towns and municipalities are increasingly finding themselves embroiled in lawsuits in which towns find themselves with no recourse but to file a lawsuit against another town that they sourced drinking water from in order to pay for PFAS-contaminated water.<sup>8</sup> Finally, in situations where a town or region's drinking water is contaminated by PFAS, private citizens are bringing more and more lawsuits seeking

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<sup>5</sup> February 22, 2021 EPA announcement regarding PFOA and PFOA final Regulatory Determination: <https://www.epa.gov/newsreleases/epa-takes-action-address-pfas-drinking-water>

<sup>6</sup> July 12, 2021 EPA announcement regarding CCL 5 and PFAS regulation as a class <https://www.epa.gov/newsreleases/epa-takes-action-address-pfas-drinking-water>

<sup>7</sup> Safer States 2019 publication: [https://saferchemicals.org/wp-content/uploads/2019/02/safer\\_states\\_costs\\_of\\_pfas\\_contamination.pdf](https://saferchemicals.org/wp-content/uploads/2019/02/safer_states_costs_of_pfas_contamination.pdf) (state specific citations supporting data found within Safer States document)

<sup>8</sup> <https://www.natlawreview.com/article/georgia-pfas-lawsuits-will-impact-product-manufacturers>

compensation for damages stemming from alleged polluted land, diminished property values, and health effects due to consumption of PFAS-contaminated water.<sup>9</sup>

The Town of Duanesburg should be extremely concerned about the potential financial ramifications that can stem from PFAS runoff from the solar panels and components installed as part of the project, PFAS contamination that could result from cracked or damaged panels on the site once installed, buried cables, battery energy storage, and PFAS pollution to the land in the event of a fire<sup>10</sup> or other event on such a potentially hazardous site. All of these events leave PFAS chemicals with but one place to go: into the soil.

What geological or hydrogeological studies have been done by the Town or the solar panel manufacturers to ensure that in such an event, PFAS runoff will not contaminate the only source of drinking water for the neighbor Mrs Biggs, whose well is less than 600 feet from the Project? The site contains 100% poorly drained soils that drains down a steep slope to Schoonmaker Road where there are eight homes with wells. Adjacent to Schoonmaker Road is a tributary that drains into the Schoharie Creek, which feeds into the Hudson River. PFAS contaminate plumes can travel great distances through soils and ground waters. The Delanson Reservoir is only three miles from the Oak Hill Solar facilities.

Have the Town or the manufacturers conducted environmental assessment studies that consider the potential for PFAS contamination of other water sources that may ultimately feed drinking water sources of other towns? Further, we understand, and the Full Environmental Assessment Form confirms, that the solar panel sites are located either entirely or in part on top of aquifers that supply drinking water. This siting only exacerbates the concern for future water or drinking water source pollution. The New York Department of Environmental Conservation's own website states clearly the foremost concern with PFAS contamination from the solar projects:

...the most productive aquifers consist of unconsolidated deposits of sand and gravel that occupy major river and stream valleys or lake plains and terraces. These aquifers typically form flat areas that are suitable for development and generally provide an ample ground-water supply. **Because of development, coupled with the high permeability of these deposits and shallow depth to the water table, makes these aquifers particularly susceptible to contamination from point sources....**<sup>11</sup> [emphasis added]

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<sup>9</sup> <https://www.natlawreview.com/article/pfas-paper-mill-lawsuit-adds-additional-companies>

<sup>10</sup> One organization found that approximately 350 solar systems had incidents of fire through February 2019. <https://pv-magazine-usa.com/2019/08/22/there-are-solar-power-fires-per-year/>

<sup>11</sup> <https://www.dec.ny.gov/lands/36118.html>

The State of New York recognizes publicly that aquifers are particularly susceptible to contamination. The Town must recognize and share the state's concern and ensure, through all the measures laid out in this report, that Duanesburg's water sources are not exposed to pollution risks from PFAS.

It is too easy to brush these concerns aside by believing that in the event of a water pollution event with respect to PFAS that the EPA or the New York Department of Environmental Conservation ("DEC") would look to the solar panel manufacturers as the responsible parties for the cleanup costs. First, that view is overly simplistic, as there is no exemption that the Town of Duanesburg would enjoy that would protect it from EPA or DEC action for cleanup costs. Second, if the solar panel manufacturers were held accountable, it is likely that they would in turn try to obtain contributory damages from other parties that it believes may be at fault, which would include the Town. Third, the majority of manufacturers are located in Asia, which may be beyond any jurisdiction in the United States and there is a reasonable chance that they could pay anything towards remediation costs.

### CERCLA Law Concerns

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also known as the Superfund law, allows the EPA to force "responsible parties" to clean up land or sites that are polluted with chemicals that are designated as "hazardous substances" under CERCLA.<sup>12</sup> What should be particularly concerning to the Town in this instance is that under CERCLA, there is no requirement that a specific amount of a hazardous substance be present on the site before the EPA can hold a party liable for the cleanup costs; the release of *any* quantity of a hazardous substance can establish liability.<sup>13</sup> The EPA's liability attribution would not merely extend to the company owning or operating the solar panels in the current instance; rather, the EPA makes clear that even landowners can be held liable under CERCLA.

In 2020 alone, the EPA reported that it disbursed or obligated over \$258 million for Superfund site cleanups, and the funds were all obtained from parties that the EPA believed were responsible.<sup>14</sup> The EPA also reported that over the life of CERCLA, over \$4.7 billion had been collected from responsible parties for cleanup of hazardous substances. Several years ago, the EPA paid for a report that, in part, studied how much per designated site was spent to clean up the site. The results should be alarming to the Town. The EPA estimated that responsible parties spent an average of \$32 million per site in cleanup costs through 1991.<sup>15</sup> A University of

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<sup>12</sup> <https://www.epa.gov/superfund/superfund-cercla-overview>

<sup>13</sup> <https://www.epa.gov/enforcement/superfund-liability>

<sup>14</sup> <https://www.epa.gov/superfund/superfund-remedial-annual-accomplishments#2020funding>

<sup>15</sup> [https://www.epa.gov/sites/default/files/2018-03/documents/ee-0265\\_1-4\\_acc.pdf](https://www.epa.gov/sites/default/files/2018-03/documents/ee-0265_1-4_acc.pdf)

Tennessee study, the results of which are cited in the EPA report, found that CERCLA / Superfund sites costed an average of between \$35 million and \$101 million in remediation costs, depending on cleanup levels needed.<sup>16</sup> Also remediation is not always possible; many sites remain contaminated but are simply monitored.

Currently, PFAS are not designated by the EPA as “hazardous substances.” However, the Biden administration’s campaign website clearly states “Biden will tackle PFAS pollution by designating PFAS as a hazardous substance....”<sup>17</sup> CERCLA allows the EPA to investigate sites and hold parties responsible for actions that polluted the land in question, *even for actions prior to the designation of a chemical as a “hazardous substance.”* Without requiring the solar panel manufacturers or suppliers to certify what, if any, PFAS are in the solar panels or the components, the Town may be opening itself up to significant financial liability once a CERCLA designation is made by the EPA. Similar to liability issues under the Safe Drinking Water Act, the EPA has the power under CERCLA to hold any party responsible for all or part of cleanup costs, including entities whose negligence (in this instance, in the lack of due diligence) contributed to the pollution events. Even if the EPA were to only pursue the solar panel manufacturers for CERCLA cleanup costs, the manufacturers would almost surely file a lawsuit against the town and any other party that it believes shared in the negligence that led to the pollution in an effort to defray cleanup costs.

Unlike the federal government, New York was the first state to designate PFOA as a hazardous substance under its state version of the CERCLA law.<sup>18</sup> In April 2016, New York added PFOS to the hazardous substance list. Similar to the federal CERCLA regulations, New York’s designation allows the state to investigate potential sources of PFOA and PFOS contamination and hold polluting parties and landowners responsible for cleanup costs.<sup>19</sup> By February 2019, New York had added 19 additional PFAS to its list of “contaminants of concern” and required existing or new state-designated “Superfund” sites to test for all 21 PFAS that the state found to be of concern.<sup>20</sup> The Town has received no documented assurances that any of the solar panels, batteries, or other components do not contain PFOA, PFOS, or any other type of PFAS, including the 19 PFAS that New York considers chemicals of concern. While manufacturing of PFOA and PFOS has largely ceased in the United States, those chemicals continue to be used in other countries in a variety of products, which is especially relevant since many solar panel components are manufactured in China. Further, as the evidence in this report shows, solar

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<sup>16</sup> Colglazier, Cox, and Davis, 1991, pp. 6’-05, cited within the report in footnote 13.

<sup>17</sup> Biden-Harris election campaign website, Environmental Justice section, <https://joebiden.com/environmental-justice-plan/>

<sup>18</sup> <https://www.dec.ny.gov/chemical/108831.html>

<sup>19</sup> <https://www.dec.ny.gov/regulations/104968.html>

<sup>20</sup> [https://alphalab.com/images/NYDEC\\_emergcontsamplngext.pdf](https://alphalab.com/images/NYDEC_emergcontsamplngext.pdf)

panels contain types of PFAS well beyond simply PFOA and PFOS. The Town is potentially exposing itself to devastating financial consequences from its current-day decision to allow a project to proceed without having received proper environmental assurances.

### **October 2021 PFAS Actions by New York**

On October 5, 2021, the New York State Department of Environmental Conservation released water quality guidance values for PFOA and PFOS. The state's recommendations are undergoing public comment until November 5, 2021.<sup>21</sup> The significance of the guidance values is that the state is now pursuing regulating two types of PFAS in more than just drinking water: in this instance, both ground and surface water. The proposal shows several things, including New York's continued aggressive pursuit of remediation of all current or future sources of the state's water, whether drinking water or not. Once passed, New York will have some of the only ground and surface water regulations for PFAS in the country, and by far the most aggressive. The proposed permissible limits of PFOA and PFOS in ground and surface water are 6.7 parts per trillion for PFOA and 2.6 parts per trillion for PFOS.

These regulations should concern the Town given the potential for water pollution from PFAS stemming from the solar panels as detailed in this report, especially with regard to anti-reflective coatings that are routinely applied to panels. The Town has, in fact, already stated in its Comprehensive Plan that included in its vision for the Town is a commitment to sustaining fresh watersheds.<sup>22</sup> The Town claims that it values protecting its water as one of the core values and visions of the Town as it moves into the future. There is no possible way that the Town can be said to uphold its vision if it pushes through a solar panel project that may result in harm to the very water resources that the Town committed itself to protect.

### **The EPA Requires PFAS Disclosures – Why Not Duanesburg?**

Saving Greene specifically recommended that the Town to require the solar panel manufacturer and installer to certify that their panels either do not contain PFAS or, if they do, which known PFAS are contained in the panels. The Town of Avon, New York recently passed a Solar Law that prohibits solar panels and equipment that contains PFAS and GenX. The EPA already insists that certain businesses disclose PFAS information used in its manufacturing processes, and so the Town should insist on the same disclosure of information.

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<sup>21</sup> <https://www.dec.ny.gov/press/123915.html>

<sup>22</sup> [https://www.duanesburg.net/sites/g/files/vyhllf4351/f/pages/duanesburg\\_2021\\_comprehensive\\_plan\\_final.pdf](https://www.duanesburg.net/sites/g/files/vyhllf4351/f/pages/duanesburg_2021_comprehensive_plan_final.pdf)



Under the EPA's Toxic Release Inventory (TRI), the EPA tracks certain toxic materials that may pose a threat to human health and the environment.<sup>23</sup> To do so, the EPA requires certain industries to report how much of certain chemicals are released into the environment. On June 22, 2020, the EPA added 172 PFAS chemicals to the TRI list, and in 2021, three additional PFAS were added to the list.<sup>24</sup> The EPA therefore recognizes the potential risk to human health and the environment of 175 types of PFAS, and requires industries discharging them to inform the EPA of that information.

### **Applicants documents**

The Applicant dropbox contains a folder "Module Information," which was uploaded September 13, 2021. The folder contains information for two different manufacturers of solar panels: Vikram Somera 380 -420 Watt VSMDHT.72.AAA.05 panels and Stave 310-330 Watt CHSM6612P panels. It unclear which panel the Applicant may use or if they many change solar panel specifications after the building permit is issued without the Town's approval. A Material and Data Safety Sheet detailing products used in manufacturing is not provided for either panel. The Town's lack of due diligence and potential lack of oversight during the construction process may expose the town and residents to PFAS and other contaminates used in the solar projects' components.

Additionally, the folder contains a six page document from Dongguan CSG Solar Glass Co, Ltd., which provides some information about the anti-reflective coating and that the warranty is for six (6) months. A second 25 page document from Dongguan CSG Solar Glass CO, Ltd. provides some information about ARC Solar Glass but omits any information about the anti-reflective coating chemical composition and manufacturing process. Curiously these documents, and the Applicant's emphasis, is how anti-reflective coating reducing glare, but it is well documented that the purpose of anti-reflective coatings is to trap certain wavelengths inside the solar panel to increase the generation of electricity. Reports show that the use of antireflective coatings may increase solar panel productivity by as much as 3 percent.

### **Additional Research**

In addition to Saving Greene's October 12, 2021 letter, I have attached to this correspondence some additional information for your consideration. The two patents and DuPont Information sheet clearly state that PFAS is used in the manufacture of solar panels.

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<sup>23</sup> <https://www.epa.gov/toxics-release-inventory-tri-program/what-toxics-release-inventory>

<sup>24</sup> <https://www.epa.gov/toxics-release-inventory-tri-program/addition-certain-pfas-tri-national-defense-authorization-act>

1. "An overview of the uses of per- and polyfluoralkyl substances (PFAS) published in Environmental Science: Process & Impacts Issue 12, 2020. Clearly states that "In the energy sector, PFAS are known to be employed in solar collectors and photovoltaic cells, and in lithium-ion, vanadium redox, and zinc batteries."
2. Patent Application Publication US 2014/0000674A1 for "Photovoltaic Module Back-sheet and Process of Manufacture filed by DuPont De Nemours and Company."
3. Patent Number US 8,344,238 B2 for "Self-Cleaning Protective Coatings for use with Photovoltaic Cells" filed by Chris M. Gronet and James K. Truman issued on January 1, 2013.
4. "DuPont Frontsheet Materials Dupont Teflon Films" indicates that the films are fluoropolymers and that the Teflon films may "last for years without degradation." It is doubtful that the films will last for the 35-40 year projected lifetime of the Project.

### In Conclusion

I request that the town uphold our Comprehensive Plan and protect the soils, ground waters and drinking water supply for the residents of Duanesburg. Require the Applicant to provide Material and Data Safety Sheets and provide escrow for the pre- and post-construction soil and water testing as well as annual testing for the lifetime of the project. Contaminating the soils with PFAS would very likely be in violation of Zoning Ordinance 14.6.2.a: "such use is reasonably necessary or convenient to the public health, welfare or the economic or social benefit of the community"; 14.6.2.4.c.2: "the proposed use will not have a significant negative effect on existing adjacent land uses"; 14.6.3.1.8: "cause harmful waste to be discharged into sewer, streams, or bodies of water or to be stored on said properties." The town should look towards the future by protecting its natural resources today.

Thank you for your time and consideration.

Respectfully,

Lynne Bruning

720-272-0956

lynnebruning@gmail.com

Cc: Supervisor Roger Tidball and the Duanesburg Town Board

Enc: Four page listing of additional PFAS research

October 12, 2021 Saving Greene letter and PFAS Report

## ARTICLES / STUDIES TESTING PFAS USE IN SOLAR CELLS

### (Article) Facts about Solar panels: PFAS Contamination

By Dr. Annick Anctil, Michigan State University

- Academic research on how PFAS could potentially be used in photovoltaic (PV) solar panels. *(Studies are outlined below)*
  - “Self-cleaning hydrophobic nanocoating on glass: A scalable manufacturing process,” *Mater. Chem. Phys.*, vol. 239, Jan. 2020.
  - Son et al., “A practical superhydrophilic self-cleaning and antireflective surface for outdoor photovoltaic applications,” *Sol. Energy Mater. Sol. Cells*, 2012.; H. C. Han et al.
  - “Enhancing efficiency with fluorinated interlayers in small molecule organic solar cells,” *J. Mater. Chem.*, vol. 22, no. 43, 2012.
- Three parts on solar panels potentially having presence of PFAS: Self-cleaning coat, adhesives, substrate.
  - Self -Cleaning Coat: Confusion comes from the fact that some other commercialized self-cleaning coating options do make use of PFAS-based chemicals, although even those do not degrade under normal use.

### Self-Cleaning Hydrophobic Nanocoating on Glass: a Scalable Manufacturing Process

*S. Maharjan et al., Mater. Chem. Phys., vol. 239, Jan. 2020.*

- Materials used in self-cleaning Coat: Trichloro(1H,1H,2H,2H-perfluorooctyl) silane (TCPFOS) (97%) and isopropanol were purchased from Sigma-Aldrich and were used without any further modification. Nitric Acid (ACS reagent, 70%) was purchased from Sigma-Aldrich and was diluted down with deionized water to achieve a pH of 3. Polycrystalline 0.1  $\mu\text{m}$  diamond suspension (MetaDi®) and polishing cloth (MasterTex, PSA, 8 in) were purchased from Buehler. Saline solution (10% w/v) was prepared by dissolving 100 g of NaCl in 1000 mL of water.
- TCPFOS is a PFAS. The study specifically looks to determine whether TCPFOS is suitable for surfaces such as solar panels as a self-cleaning coating. The study concludes that “[TCPFOS] are therefore well suited for a range of applications including self-cleaning of solar panels.”

Enhancing efficiency with fluorinated interlayers in small molecule organic solar cells (Web link)

*J. Mater. Chem., vol. 22, no. 43, 2012*

- This study presents a simple approach to improve the performance of small molecule based organic solar cells (OSCs) by inserting a fluorinated buffer layer (e.g. PFAS) at the hetero interface of bilayer devices. As demonstrated in this work, the PFAS modification reduces the surface energy of the conventional PEDOT : PSS photoanode and results in a significant improvement in the pentacene based OSC.
- Concurrently, the accumulated negative charges of the fluorinated PFAS layer result in the development of interfacial dipole moments that in turn lead to an enhanced built-in potential across the devices, and consequently enhanced hole transport efficiency
- [Link to Study](#)
- This study specifically sets out to study whether PFAS improves the efficiency of solar panels, and concludes that the PFAS will lead to greater efficiencies.

**MENTIONS OF PFAS USE IN SOLAR ENERGY - ACADEMIC STUDIES**

Polyfluoroalkyl-silica porous coatings with high antireflection properties and low surface free energy for glass in solar energy application (Web link)

*Volume 509, 15 April 2020, 144864*

- *Available for purchase at the following [Study Link](#)*
- **Abstract:** Polyfluoroalkyl-silica porous coating stacks with durable antireflection (AR) properties have been obtained for photovoltaic (PV) application. The aim was to obtain a low surface energy coating, devised to mitigate soiling adherence, without losing the AR properties of a baseline coating. Those optical properties were inalterable after accelerated aging tests, which sustains the reliability of the materials for solar energy applications.

An overview of the uses of per-and polyfluoroalkyl substances (PFAS)

*Environ. Sci.: Processes Impacts, 2020, 22, 2345-2373*

- In the energy sector, PFAS are known to be employed in solar collectors and photovoltaic cells, and in lithium-ion, vanadium redox, and zinc batteries. In addition, fluoropolymers are also used to coat the blades of windmills.

- Under PFA Use Categories and subcategories: Solar collectors and photovoltaic cells listed.

Mechanical properties and field performance of hydrophobic antireflective sol-gel coatings on the cover glass of photovoltaic modules

*Solar Energy Materials and Solar Cells, Volume 216, October 2020, 110694*

- *Full Study available for purchase at the following [Study Link](#)*
- **Highlights:** Abrasion resistance of polyfluoroalkyl silica layer improved with inner dense layer.
- **Abstract:** Properties of methyl-silylated silica and **polyfluoroalkyl-silica** mono- and bi-layer stacks were compared to achieve the most rational AR design based on a proper trade-off between cost-efficiency, processability, optical properties, mechanical properties and reliability during real life operation.

**PATENTS RELATED TO SOLAR PANEL COATING PRODUCTS**

DuPont – US Patent for Photovoltaic Module Back-Sheet

- **Abstract:** An integrated back-sheet for a photovoltaic module is provided. A process for forming the back-sheet includes the steps of providing a fluoropolymer film...When incorporated into a photovoltaic module, the polymer layer of the back-sheet is adhered directly to the rear surfaces of a plurality of solar cells.
- List of materials and chemicals provided on Page 10-11.
- This is a patent by DuPont for a component (a sheet) used within photovoltaic solar panels. See page 9 of the patent, which states “A 5 mil thick cell support release sheet made of Teflon PTFE was place over the PVF film of the laminate, followed by a PTFE based heat bumper.” PTFE is a type of PFAS. This is direct evidence that even American-made solar components utilize PFAS.

Patent – Self-Cleaning Protective coatings for use with photovoltaic cells

- **Abstract:** Systems and materials to improve photovoltaic cell efficiency by implementing a self-cleaning function on photovoltaic cells and on albedo surfaces

associated with photovoltaic cell assemblies are provided. Materials for protecting albedo surfaces that surround photovoltaic cell assemblies, thereby maximizing energy input into the photovoltaic cell assemblies, are provided.

- Table 1 – Exemplary materials for assembling layer 208 and 306
- Table 1 of this patent is key. On page 18 of the PDF (and what is page 14 of the patent) is a section in the table titled “water-repellent fluor-resin.” There are at least 10 PFAS listed in this portion of the chart. This is direct evidence of use of PFAS in self-cleaning agents for photovoltaic solar panels.

### OTHER MATERIALS

#### Interstate Technical Regulatory Council PFAS Guidance

- **Page 38 of PDF (page 33 of document):** “Solar industry includes Polymer and nonpolymer PFAS types. Fluoropolymer films (such as FEP, PVDF) to cover solar panel collectors, electrolyte fuel cells, PTFE expansion joint materials for power plants.”
- This would be evidence of a regulatory council acknowledging that solar panels utilize PFAS components.

#### DuPont Frontsheet Materials – DuPont Teflon Films

- Dupont Teflon FEP and EFTE films are used to make solar panels for portable and grid-connected applications.
- Material sheet includes information on light transmission and power output for Feflon FEP films.
- This is a DuPont information sheet that makes crystal clear that they sell fluoropolymers for solar panel coating applications. Fluoropolymers are a sub-set of the PFAS category. Also note numerous references specifically to Teflon, the trademarked brand name for a host of fluorine-containing polymers (i.e. – PFAS).



lynne bruning &lt;lynnebruning@gmail.com&gt;

## Oak Hill solar plants: PFAS and the precautionary principle (report attached)

1 message

Kris Martin &lt;ksvsm@yahoo.com&gt;

Mon, Oct 11, 2021 at 11:32 PM

To: "jhowe@duanesburg.net" <jhowe@duanesburg.net>, "RTidball@duanesburg.net" <RTidball@duanesburg.net>, jsscmitt@duanesburg.net, "mdeffer@duanesburg.net" <mdeffer@duanesburg.net>

### Saving Greene: Citizens for Sensible Solar

PO Box 369 Coxsackie NY 12051

SavingGreene@gmail.com

SavingGreene.com

11 October 2021

*Via e-mail*

Roger Tidball, Town Supervisor  
 Jeffrey Scmitt, Planning Board Chairman  
 Town of Duanesburg  
 5853 Western Turnpike  
 Duanesburg NY 12056

Re: Applying the **precautionary principle** to Oak Hill solar and battery projects

Dear Supervisor Tidball and Chairman Scmitt:

We understand that your town is in the process of approving the construction of solar and li-ion battery storage projects. As an organization, Saving Greene has spent almost four years analyzing solar projects in and around Greene County. Recently it came to our attention that PFAS chemicals may be used in some solar panel coatings, as well as wires, batteries, and other equipment used to construct solar plants and may come into contact with soil and water. Some of these coatings appear to be unstable over time.

PFAS are a group of manmade "forever chemicals" that persist for very long periods in the human body as well as in soil and water. They comprise a group of roughly 5,000 substances, some of which can cause affect reproduction, development, and immunology, as well as cause cancer and thyroid hormone disruptions in laboratory animals. [1] Because of their persistence in the environment, they are extremely difficult to remove when detected. Prevention is essential.

The attached document was submitted in the legal proceeding for Hecate Energy's Greene County Solar Facility in Coxsackie NY. In it you will see why you should apply the **precautionary principle** prior to construction: "When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause-and-effect relationships are not fully established scientifically." [2] In environmental decision-making, the application of this principle requires that we take preventative action in the face of uncertainty by shifting the burden of proof to the parties responsible for the activity, investigating alternatives to potentially harmful activities, and encouraging public participation in making decisions that may affect public health. [3]

We are aware that the Oak Hill solar projects include both solar modules and battery energy storage systems (BESS). According to project documents, including the FEAF, SWPPP, and our own research, these projects will be sited on poorly drained and/or hydric soils with high runoff potential. Some of the terrain under the panels has slopes of 10-15%. As you can imagine, these conditions raise particular worries regarding contaminated runoff.

The EPA has determined that PFAS are present in some anti-reflective solar panel coatings—as well as wires and batteries—used to construct solar facilities. In 2018, *The Carolina Journal* reported that the EPA confirmed PFAS are used in solar panels. [4] Protective regulations for both

these chemicals are being implemented both at state and federal levels. While some coatings appear stable, others can break down quickly on exposure to UV light.

We strongly recommend that you apply the **precautionary principle** to intervene prior to construction. In particular, you should require the developer to provide Material and Data Safety Sheets documenting that equipment installed on site does not contain PFAS or other toxic chemicals. Because over 70% of solar panels are manufactured in China,[5] where accurate and transparent information is not always readily available, we also recommend that baseline and annual post-construction soil and water testing be conducted both on the site and surrounding points, at the project developer's expense. If coatings *do* leach from the panels or other components, contaminants may be carried by runoff into surrounding areas and flow onto neighboring properties, streams, and tributaries, as well as into a major aquifer located directly below the site.

We cannot stress strongly enough the importance of *preventing* possible contamination. If the panels and other components (including batteries) do contain PFAS, such contamination could produce devastating consequences. Responsible developers should not hesitate to provide you with specific documentation proving to your satisfaction that PFAS coatings were not used in any of the components to be installed on this site.

Sincerely,

Kim Rose, spokesperson  
Saving Greene: Citizens for Sensible Solar

Ref: Saving Greene: *PFAS and other compounds in solar panels, wiring, and coatings.*

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[1] <https://www.epa.gov/pfas/basic-information-pfas#exposed>


[2] Hayes AW. The precautionary principle. *Arh Hig Rada Toksikol.* 2005 Jun;56(2):161-6. PMID: 15968832.

[3] Kriebel, D et al. "The precautionary principle in environmental science." *Environmental health perspectives* vol. 109,9 (2001): 871-6. doi:10.1289/ehp.01109871

[4] <https://www.carolinajournal.com/news-article/epa-confirms-genx-related-compounds-used-in-solar-panels/>

[5] <https://www.instituteforenergyresearch.org/renewable/solar/chinese-solar-panel-production-issues-are-mounting/>

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 **PFAS and other compounds.pdf**  
407K





PO Box 369 Coxsackie NY 12051  
SavingGreene@gmail.com  
SavingGreene.com

## **PFAS and other compounds in solar panels, wiring, and coatings**

Renewable energy should offer more than promises that it is good for the environment. The solar industry promotes photovoltaic (PV) technology in the most wholesome terms: generating clean, free power from the sun. This benevolent assessment potentially omits environmental impacts during the manufacturing, operational lifetime, and disposal of solar panels and battery storage systems. Host towns need proof, not simply promises, when evaluating how solar projects may affect their residents and environment, both now and in the future.

### **Introduction**

In July 2021, the Town of Avon, New York adopted Local Law 3 of 2021. This precedent-setting amendment to the local solar law prohibits using solar panels that “utilize or contain any amount of GenX chemicals or polyfluoroalkyl (PFAS) substances.”<sup>1</sup> This position aligns with state and federal laws protecting our water supply. For the long-term safety of Coxsackie residents, Hecate Energy (Hecate) and its successors should agree to a Certificate condition that prior to construction, Hecate will provide documentation verifying that the solar panels and associated electrical equipment used to construct the Greene County Solar Facility (the Facility) do not contain per- and polyfluoroalkyl substances (PFAS), including PFOA, PFOS, and GenX chemicals.

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<sup>1</sup> <https://www.avon-ny.org/PDFs--Town%20Clerk/113-2021.pdf>

We would like to believe that Hecate's commitment to our town's public health and safety, as well as their desire to avoid potential future liability, would encourage them to give these comments careful consideration. Hecate must rely on manufacturers' data, which may not be fully transparent for solar panels and lithium-ion batteries, especially when they are manufactured outside of the United States—in this case often in China.

This Certificate condition would help safeguard our soil, surface waters, and groundwater from potential contamination. While such protection would help protect Sleepy Hollow's water supply, it provides important safeguards for all residents living in the vicinity of the Facility. Hecate and the Town of Coxsackie should perform pre- and post-installation soil and water testing, with annual monitoring. In addition, the installer should fund an escrow account for the Town to hire an independent, certified third-party laboratory for soil and water testing.

## **PFAS and related compounds**

According to the National Institute of Environmental Health Sciences, perfluoroalkyl and polyfluoroalkyl substances (PFAS) are toxic, persistent, and bioaccumulative.<sup>2</sup> These synthetic fluorochemicals were first developed in the 1930s and have strong carbon-flourine bonds that make the structure repel both oil and water.<sup>3</sup> The Green Science Policy Institute details that these manmade chemicals are widely used in building materials such as paints, cleaning products, non-stick coatings, sealants, tapes, wire coverings, glass, solar panels, and batteries.<sup>4</sup> PFAS is commonly found in foam used to extinguish electrical fires.<sup>5</sup>

These “forever chemicals” have been linked to cancer and other health issues. Certain PFAS do not break down easily, causing them to remain indefinitely in the soil and water. Their potential hazard and persistence in the environment may pose a cumulative danger to public health. PFAS comprise a group of compounds, including PFOA, PFOS and GenX chemicals. The United States Environmental Protection Agency (EPA) has

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<sup>2</sup> <https://www.niehs.nih.gov/health/topics/agents/pfc/index.cfm>

<sup>3</sup> <https://www.nature.com/articles/d41586-019-00441-1>

<sup>4</sup> <https://greensciencepolicy.org/docs/pfas-building-materials-2021.pdf>

<sup>5</sup> <https://www.gao.gov/assets/gao-21-421.pdf>

identified that the potentially toxic and carcinogenic nature of many of these chemicals demands careful evaluation.<sup>6,7</sup>

The disposal of PFAS-containing materials is problematic, as evidenced by the recent cleanup and lawsuits filed against Noralite Hazardous Waste Facility in Cohoes, New York.<sup>8</sup> In July 2021, the village of Hoosick Falls reached a \$65 million settlement with Saint-Gobain, Honeywell International, 3M, and DuPont for PFOA contamination of their groundwater that affected at least 544 private wells.<sup>9</sup> Unfortunately the water remains contaminated, and the plant that used PFOA chemicals has been declared a Superfund site.

## PFAS legislation in New York State

In 2016, the NYS Department of Environmental Conservation (DEC) issued a regulatory impact statement to 6 NYCRR Part 597 adding PFOA and PFOS as hazardous substances. This ruling was adopted by the DEC in March 2017.<sup>10</sup> In July 2020, NYS passed S.8817 and A.4739-C, which ban the use of PFAS in food packaging.<sup>11</sup> And in August 2020, the NYS Department of Public Health (DPH) voted to set the maximum contaminant levels (MCLs) at 10 parts per trillion (10 ppt) for both PFOA and PFOS in our drinking water supply.<sup>12</sup> NYS legislation permits the DPH to require that public water systems are tested for the contaminants and ensure that elevated levels are addressed.<sup>13</sup>

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<sup>6</sup> <https://www.epa.gov/pfas/basic-information-pfas>

<sup>7</sup> <https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/risk-management-and-polyfluoroalkyl-substances-pfas>

<sup>8</sup> <https://www.wamc.org/capital-region-news/2020-06-25/cohoes-residents-file-intent-to-sue-noralite-over-burning-firefighting-foam>

<sup>9</sup> <https://pfasproject.com/hoosick-falls-new-york/>

<sup>10</sup> <https://www.dec.ny.gov/regulations/104968.html>

<sup>11</sup> <https://www.nysenate.gov/legislation/bills/2019/s8817>

<sup>12</sup> [https://www.health.ny.gov/environmental/water/drinking/docs/water\\_supplier\\_fact\\_sheet\\_new\\_mcls.pdf](https://www.health.ny.gov/environmental/water/drinking/docs/water_supplier_fact_sheet_new_mcls.pdf)

<sup>13</sup> <https://news.bloomberglaw.com/environment-and-energy/new-york-moves-on-some-of-strictest-pfas-drinking-water-limits>

## PFAS legislation in other states

North Carolina is among the top three states for solar development. By February 2018, residents and the state were questioning the presence of PFAS in solar panels.<sup>14</sup> *The North Carolina State Journal* reported that EPA physical scientist Dr. Mark J. Strynar provided 39 records from the SciFinder database used by the EPA to identify applications of PFAS with solar panels.<sup>15</sup> In August 2018, *The Carolina Journal* reported that the EPA confirmed that PFAS are used in solar panel production.<sup>16</sup> While studies may not be conclusive, the lack of definitive conclusions and transparency raises concerns.

In December 2020, Marc Fitch of the Yankee Institute reported that the Connecticut Department for Health was concerned about PFAS in solar panels.<sup>17</sup> "We've asked the question, have received some information, and have also received some push-back when we ask those questions about whether these panels contain PFAS and different PFAS chemicals." It is the lack of answers and documentation that is troubling and raises questions of the long term impact of solar panels and battery storage on our soils and drinking water.

## PFAS Federal legislation

Federal regulations surrounding PFAS are being adopted rapidly, and further restrictions at the national level are expected. US Representative Debbie Dingell (D-MI-12) sponsored Bill H.R.2467, PFAS Action Act of 2021, to "establish requirements and incentives to limit the use of perfluoroalkyl and polyfluoroalkyl substances, commonly referred to as PFAS, and remediate PFAS in the environment."<sup>18</sup> The Bill passed the House July 21, 2021 and is awaiting a vote in the Senate.<sup>19</sup> The Executive Office of the President and other advocacy groups such as Consumer Reports support passage of the

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<sup>14</sup> <https://nsjonline.com/article/2018/02/solar-panels-could-be-a-source-of-genx-and-other-perflourinated-contaminants/>

<sup>15</sup> [https://nsjonline.com/wp-content/uploads/2018/02/perfiuoro-and-solar-panels-Reference\\_02\\_15\\_2018\\_120238-002.pdf](https://nsjonline.com/wp-content/uploads/2018/02/perfiuoro-and-solar-panels-Reference_02_15_2018_120238-002.pdf)

<sup>16</sup> <https://www.carolinajournal.com/news-article/epa-confirms-genx-related-compounds-used-in-solar-panels/>

<sup>17</sup> <https://yankeeinstitute.org/2020/12/03/department-of-public-health-concerned-about-pfas-in-solar-panels-near-drinking-water/>

<sup>18</sup> <https://debbiedingell.house.gov/news/documentsingle.aspx?DocumentID=2975>

<sup>19</sup> <https://www.congress.gov/bill/117th-congress/house-bill/2467>

Bill.<sup>20, 21</sup> Additionally, the Environmental Protection Agency (EPA) proposes reporting and record-keeping requirements for PFAS under the Toxic Substances Control Act (TSCA).<sup>22</sup>

The August 3, 2021, *National Law Review* included an article by John Gardella of CMBG3 Law in Boston. He concludes that while the US Senate vote has not been determined, that “the pressure is on the EPA to take regulatory action well beyond just drinking water, and companies absolutely must begin preparing now for regulatory actions that will have significant financial impacts down the road.”<sup>23</sup>

## **PFAS in solar panel and battery manufacturing**

Despite industry and a few academic assurances to the contrary, broad research consistently indicates that PFAS chemicals are used in solar panel and battery manufacturing and installation. PFAS is found in the coatings on electrical wires, backing panels, tapes, and adhesives.

Of particular concern is the use of PFAS in anti-reflective coatings (ARC) and anti-soil coatings (ASC) that are used to increase solar panel productivity. Material and Data Safety Sheets detail the contents of products manufactured in the United States. However, at this time, China is the major supplier of polysilicon<sup>24</sup> solar panels and batteries.<sup>25</sup> Accountability and transparency for materials and products made outside of the United States is questionable. In June 2021, the Biden administration banned import and use of certain solar energy materials and products from China due to the country’s use of forced labor and genocide at polysilicon mines.<sup>26</sup>

Two types of solar panel coatings are commonly used: anti-reflective coatings (ARC) and anti-soil coatings (ASC)

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<sup>20</sup> <https://www.whitehouse.gov/wp-content/uploads/2021/07/HR2467.SAP-Final.docx.pdf?source=email>

<sup>21</sup> [https://advocacy.consumerreports.org/press\\_release/house-votes-to-approve-the-pfas-action-act-hr-2467/](https://advocacy.consumerreports.org/press_release/house-votes-to-approve-the-pfas-action-act-hr-2467/)

<sup>22</sup> <https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/risk-management-and-polyfluoroalkyl-substances-pfas>

<sup>23</sup> <https://www.natlawreview.com/article/congress-presses-forward-pfas-measures>

<sup>24</sup> <https://www.solarpowerworldonline.com/2021/05/no-avoiding-it-now-soon-the-top-4-polysilicon-manufacturers-will-be-based-in-china/>

<sup>25</sup> <https://www.forbes.com/sites/rropier/2019/08/04/why-china-is-dominating-lithium-ion-battery-production/?sh=770793d123786>

<sup>26</sup> <https://www.ecowatch.com/china-solar-panels-ban-biden-2654961710.html>

## Anti-Reflective Coating (ARC)

A bare silicon glass surface may have a reflection index of more than 30%.<sup>27</sup> Anti-reflective coatings (ARC) are used to increase solar panel productivity by adding a dielectric coating on the glass surface. This coating textures the glass surface, which results in specific bands of wave lengths to be trapped inside the panel where they can generate additional electricity by coming in contact with the photovoltaic cells.

In their Application Appendix 15-A: Glare Analysis, Hecate Energy states that the panels they expect to use will have an anti-reflective coating, presumably to increase efficiency.

## Anti-Soil Coating (ASC)

Dust and dirt can foul the panel surface and hinder the conversion of light to electricity. To maintain steady performance, the panel's surface must be cleaned regularly. Current manual or robotic cleaning methods are expensive and inefficient.

The hydrophobic qualities of ASCs create a non-stick surface that promotes water shedding, resulting in "self-cleaning" solar panels. This coating is applied to the front facing glass surface at the time of manufacture. The water-repelling surface promotes water cohesions, allowing the water droplets to form fully with minimal surface contact. This enhances water droplet shedding and in the process removes dust and dirt from the surface of the panel. ASCs help decrease maintenance costs while increasing the electricity generated. It can be reapplied in the field with products such as 3M AS Liquid 600.<sup>28</sup>

ASC is typically manufactured with either silicon dioxide (SiO<sub>2</sub>) or titanium dioxide (TiO<sub>2</sub>) nanoparticles combined with long chains of fluoropolymers. While SiO<sub>2</sub> may be inexpensive it is less durable to environmental elements. TiO<sub>2</sub> appears to be more stable and is reported to be more frequently used for solar panel ASC.

There are increasing concerns about the negative impact of TiO<sub>2</sub> on the environment and human health. In December 2020, California announced the review of titanium dioxide nanoparticle classification under their Safe Water Act Proposition 65.<sup>29</sup>

Gohar Dar's book *TiO<sub>2</sub> Nanoparticles*, published in February 2020, includes a chapter on "Toxicity of TiO<sub>2</sub> Nanoparticle". This research indicates that lung tumors are found in

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<sup>27</sup> <https://www.pveducation.org/pvcdrom/design-of-silicon-cells/anti-reflection-coatings>

<sup>28</sup> [https://www.coatingsworld.com/issues/2012-10/view\\_paint-amp-coatings-manufacturer-news/3m-rolls-out-pv-anti-soiling-coating/](https://www.coatingsworld.com/issues/2012-10/view_paint-amp-coatings-manufacturer-news/3m-rolls-out-pv-anti-soiling-coating/)

<sup>29</sup> <https://www.paintsquare.com/news/?fuseaction=view&id=23184>

mice that have had long term exposure to TiO<sub>2</sub>.<sup>30</sup> Chapter 2: “Applications in Nanobiotechnology and Nanomedicine” research indicates safety concerns regarding TiO<sub>2</sub> nanoparticles on aquatic species.<sup>31</sup>

While the potential for titanium dioxide nanoparticles to contaminate our soils is not conclusive, the possibility warrants further investigation. The evidence appears to be mounting, and the developer should carry the burden of proof.

Research papers call for caution and further study of ARC and ACS on solar panels. Natatajan Shanmugam’s May 2020 study “Anti-Reflective Coating Materials: A Holistic Review from PV Perspective,”<sup>32</sup> published in *Energies*, provides a 98-page comprehensive report. On page 67 the author states: “The implementation of ARCs on the solar cell would suppress the reflection, and in turn, enhances the PCE, [power conversion efficiency] but their durability with continuous exposure to the environment and performance degradation characteristics are some novel areas where research is required.”

ARC and ASC resist some stresses, but not others:

[T]he coatings may resist the harsh environmental stresses such as damp heat and humidity freeze, but they are susceptible to damage under UV exposure. XPS analysis revealed a clear reduction in fluorine in the composition of the coating after exposure to UV and outdoor testing.<sup>33</sup>

Kenan Isbilir’s 2019 thesis at Loughborough University studies the “performance and durability of anti-reflective and anti-soiling coatings on solar cover glass”<sup>34</sup> His thesis investigated the durability of commercially available two types of single layer (ARC1 and ARC2) and one multilayer anti-reflective (MAR) commercially available coatings, as well as ASCs. After testing several coatings, he concludes that:

The durability of these coatings against UV light and abrasion resistance would need to be improved if they are to be applied to PV cover glass.

In 2020, Gizelle C. Oehler found that certain ASC break down in as little as two weeks:

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<sup>30</sup> <https://onlinelibrary.wiley.com/doi/abs/10.1002/9783527825431.ch2>

<sup>31</sup> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3720578/>

<sup>32</sup> [https://www.researchgate.net/publication/341556138\\_Anti-Reflective\\_Coating\\_Materials\\_A\\_Holistic\\_Review\\_from\\_PV\\_Perspective](https://www.researchgate.net/publication/341556138_Anti-Reflective_Coating_Materials_A_Holistic_Review_from_PV_Perspective)

<sup>33</sup> [https://www.researchgate.net/publication/329506058\\_Testing\\_of\\_an\\_Anti-Soiling\\_Coating\\_for\\_PV\\_Module\\_Cover\\_Glass](https://www.researchgate.net/publication/329506058_Testing_of_an_Anti-Soiling_Coating_for_PV_Module_Cover_Glass)

<sup>34</sup> [https://repository.lboro.ac.uk/articles/thesis/The\\_performance\\_and\\_durability\\_of\\_anti-reflective\\_and\\_anti-soiling\\_coatings\\_on\\_solar\\_cover\\_glass/8132048/1](https://repository.lboro.ac.uk/articles/thesis/The_performance_and_durability_of_anti-reflective_and_anti-soiling_coatings_on_solar_cover_glass/8132048/1)

Surprisingly, the coatings began to degrade quickly, and the effect was clear after only two weeks of exposure. Degradation resulted in decreasing water contact angle and increasing roll-off angles. As observed by Bhaduri et al., the degradation was much faster than anticipated because the outdoor environment combines the stresses tested in the laboratory [31]. Degradation was caused by a number of mechanisms including solvent release, fluorine loss, thinning of the coating, and increasing surface macro-roughness.<sup>35</sup>

The location or accumulated amounts of the degraded chemicals is not discussed in these studies. It is logical to assume that the chemicals sloughing off with the rainwater are deposited into the underlying soil, groundwater and aquifers. The cumulative effect of tens of thousands of solar panels for 35 or more years would most likely permanently contaminate the site's groundwater, soil, and stormwater runoff. If coatings are reapplied during the projects lifetime then additional concerns are raised. How is the ground protected during reapplication? How often is the coating reapplied to the panels on site? Improper disposal of broken and decommissioned solar panels may permanently contaminate landfills and any nearby aquifers. If regulations continue to become more restrictive, how will the panels be disposed of, and is the decommissioning fund adequate?

Millions upon millions of solar panels will be used and disposed of within New York State during the next two decades. Periodic upgrades and damage or defects will need to be addressed long before the end of the project's life.<sup>36</sup> Developers should carry the burden of proof that their materials and products do not contain PFAS. Towns and taxpayers should trust but verify all materials provided by the developers. The people cannot afford the risk that solar panels and storage batteries may contaminate our drinking water and soil, either upon installation, during use, or during disposal. It seems doubtful that developers' required liability coverage would be sufficient for a large-scale PFAS cleanup project.

In June 2021, Niagara County adopted an Extended Producer Responsibility (EPR) law to protect their landfills from being overburdened by the disposal of solar panel waste. The law requires "producers of solar panels sold in the county to finance and manage their safe reuse and recycling when decommissioned."<sup>37</sup> Phone calls to Greene and Columbia county landfills have not provided confirmation that they will accept large quantities of solar panels, either today or in the future. One company suggested contacting We Recycle Solar, which is located in Arizona. State and federal laws for PFAS are

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<sup>35</sup> [https://repository.lboro.ac.uk/articles/journal\\_contribution/Testing\\_the\\_durability\\_of\\_anti-soiling\\_coatings\\_for\\_solar\\_cover\\_glass\\_by\\_outdoor\\_exposure\\_in\\_Denmark/11558853](https://repository.lboro.ac.uk/articles/journal_contribution/Testing_the_durability_of_anti-soiling_coatings_for_solar_cover_glass_by_outdoor_exposure_in_Denmark/11558853)

<sup>36</sup> <https://hbr.org/2021/06/the-dark-side-of-solar-power>

<sup>37</sup> <https://www.productstewardship.us/news/571089/Niagara-County-Passes-Nations-2nd-Solar-Panel-Producer-Responsibility-Law.htm>



likely to become more numerous and stringent. The town and county should consider the possibility of PFAS contamination from solar panels deposited in our local landfills and require developers to prove that their installations will not include products containing PFAS.

## Industry Response

Manufacturers of ARC and ASC may understand the environmental concerns and toxicity risks of their products. A few companies are beginning to provide non-toxic coatings. One company's solution is a proprietary nanoparticle coating that is an environmentally friendly.

WattGlass has addressed and overcome many of the issues typical of other antireflective coatings (ARCs): things such as toxicity, shelf life, and durability. WattGlass is happy to offer a non-toxic, water based, long shelf-life solution to existing ARC technologies that is easily implemented as a drop in replacement.<sup>38</sup>

Solar ARC surpasses the performance of conventional coatings and is resistant to particulate soiling while remaining non-hazardous and 100% water-based. Typically, these coatings result in tradeoffs between performance and functionality and utilize hazardous materials such as solvents, acids, and fluorocarbons. Not with WattGlass.

If Watt Glass feels it is important to stress their environmentally friendly non-fluorocarbon solution again and again, it raises the obvious question: what are the other companies using, and how might their products harm our soil, water, and public health?

## What's next

On August 19, 2021, OxyChem announced that it was closing its Niagara Falls plant, the site of America's first major environmental disaster, Love Canal. In 1988, NYS Department of Health Commissioner David Axelrod called the Love Canal incident a "national symbol of failure to exercise a sense of concern for future generations."<sup>39</sup>

Solar energy resources are marketed as an environmentally-friendly way to generate electricity. However, research indicates that solar panels, coatings, wire coverings, tapes, adhesives and batteries contain PFAS that may permanently harm our soils and poison our drinking water.

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<sup>38</sup> <https://www.wattglass.com/technology>

<sup>39</sup> <https://www.nytimes.com/1988/08/05/nyregion/after-10-years-the-trauma-of-love-canal-continues.html>

An October 2020 Bloomberg Law article provides insight into upcoming PFAS regulations in relation to the Development of renewable energy in New York State.

Overall, along with the CLCPA, the new Siting Law and the expected PFAS regulations fundamentally change long-standing environmental paradigms in New York State. The flurry of regulations expected from Albany in the next few years will usher in a new era of environmental regulation quite different from today. Those well prepared for the transition will be positioned to prosper from it, while those who are not will fall behind or find their business plans or goals outdated or not fully achievable.<sup>40</sup>

## Conclusions

Renewable energy developers are responsible to their investors. Not the town. Not the neighbors. And not the environment. Solar projects are held by individual LLCs whose only asset may be an aging infrastructure built on leased ground. At time of decommissioning—or evidence of contaminants—it is unlikely that there will be a deep-pocketed corporation to bring the site into compliance with current or future EPA and DEC standards.

The July 2021 ruling on the Fieldwood Energy, LLC bankruptcy case sets precedent that previous oil well owners, and the insurance companies that issue them bonds, are responsible for the cleanup cost of wells.<sup>41</sup> Insurance company trends with oil and gas may become the standards for the renewable energy sector, making it difficult and costly to insure solar power plants.

Prior to construction, Hecate Energy should be held responsible to neighboring residents and Coxsackie's municipal government by providing documentation that the solar panels, coatings, and electrical infrastructure specified for the project do not contain PFAS or other toxic chemicals. Attempting to remedy a “forever chemical” such as PFAS contamination over more than a thousand acres of solar coverage would likely be impossible.

While there are a few alternative options that may be safer, these products are more expensive and are manufactured in smaller quantities. Utility-scale solar power plants require hundreds of thousands, if not millions, of photovoltaic panels at the time of installation. The ability to manufacture and deliver this quantity is limited to the very largest

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<sup>40</sup> <https://news.bloomberglaw.com/environment-and-energy/impact-of-new-yorks-renewable-energy-permitting-program-pfas-regulation>

<sup>41</sup> <https://www.bondexchange.com/oil-industry-woes-lead-to-massive-changes-in-the-insurance-industry/>

suppliers, most of them based in China, where Material Data and Safety Sheets are limited and if provided the information is questionable.

Reputable solar panel manufacturing companies that freely provide Material Data and Safety Sheets may be limited. Solar developers that provide toxicity guarantees on their panels being free of dangerous chemicals may be even fewer. While the level of toxicity of ARC and ASC may lack clarity, the coatings' exposure to the elements and where the sloughed-off chemicals will be deposited is not. The chemicals are likely to enter the soil and groundwater.

When reviewing this Application, the Siting Board must not rely on good intentions. As has been noted throughout this proceeding, multiple solar projects will be constructed in the watershed of Sleepy Hollow Lake. Measures should be taken to determine that panels, electrical infrastructure, and wiring for these projects is PFAS-free.

What we are discussing here is a matter of public health and safety, we encourage the Board to require developers to provide specification sheets, and to describe preventive measures, testing policies, and Material and Data Safety Sheets in order to protect Coxsackie public health and to protect the town from future liability. Preventative measures – not after-the-fact remediation – are the answer to avoiding PFAS contamination of soil, stormwater runoff, drinking water, and aquifers surrounding the project.

