3307 Main Street
P.O. Box 294
Morgantown, PA 19543

CAERNARVON TOWNSHIP
CONDITIONAL USE APPLICATION

Phone: 610-286-1010
Fax: 610-286-1001
info@caernarvon.org

Applicant Information

Name: Jared S. & Marla J. Kurtz and Elverson AD 1, LLC

Address: 133 Boston Post Road, Building 15, Second Floor

City: Reston State: MA Zip: 02493

Phone: 617-780-5195 Email: lmcdonald@vanguardrenewables.com

Interest of Applicant, if not owner (agent, lesee, etc.) Lessee

Owner Information

Name: Jared S. & Marla J. Kurtz

Address: 4366 Main Street

City: Elverson State: PA Zip: 19520

Phone: Email: jaredskurtz@gmail.com

Attorney for Applicant Information

Name: J. Dwight Yoder, Esq.

Address: 2933 Lititz Pike PO Box 5349

City: Lancaster State: PA Zip: 17606

Phone: 717-291-1700 Email: dyoder@gkh.com

1. Brief Description of Real Estate Affected:

Tax Parcel #(s): 35533001164380 Block No.

Address: 4366 Main Street, Elverson, PA 19520

Lot Size: 53.03 acres Deed Book No.: Instrument #2022027589 Page No.:

Present Zoning Classification: Effective Agricultural Preservation Present Use: Agricultural

Present Improvements on Land: Farm dwelling, barns and other agricultural buildings

2. Specific Section(s) of the Zoning Code upon which this Application is based:

Section 543.A.1 and Section 653

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3. Describe the Proposed Use of Property

Establish and operate a regional anaerobic digester. Please see attached Supplement.

4. Briefly State the Applicant's reason(s) for submitting the application:

NOTE: The applicant or its representative(s) shall be required to provide testimony at the Board of Supervisor's hearing(s) at which this application is considered.

Please see attached Supplement.

5. Answer the Following Questions and Provide a Date of Previous Application (if known):

Has a previous Conditional Use Application been filed for this Property? ☐Yes ☒No _____

Has a previous Zoning Hearing Board Application been filed for this Property? ☐Yes ☒No _____

Has a previous Subdivision or Land Development Application been filed for this Property? ☐Yes ☒No _____

In addition to this application, documentation must be submitted in compliance with Section 705 of the Caernarvon Township Zoning Ordinance, as amended (Township Code Section 500-79); reproduced here for convenience.

Conditional use procedures. The procedure for granting of conditional use in any zoning district shall be as follows:

A. The applicant shall file an application for a conditional use permit with the Board of Supervisors. The application shall contain the following material:

(1) Appropriate design plans and/or specifications, in sufficient detail to demonstrate compliance with conditional use requirements.

(2) Photographs depicting the site.

(3) Appropriate responses to any known or suspected site development problem.

(4) Other related information required to support the application.

My signature authorizes permission to post this property and permission to Township officials and staff to enter thereon for inspection purposes.

I certify that the information provided on this application and supporting documentation and plans are true and correct to the best of my knowledge, information and belief.

DPARTMENT USE ONLY

C.U. Application #: _____

Date Received: _____

Fee Paid: $ _____ Date Paid: ____/____/____

SIGNATURE: _____

PRINT NAME: J. Dwight Yoder
Attorney for Applicants

3307 Main Street
P.O. Box 294
Morgantown, PA 19543

CAERNARVON TOWNSHIP
CONDITIONAL USE APPLICATION

Phone: 610-286-1010
Fax: 610-286-1001
info@caernarvon.org

APPENDIX A

Section 705 (Township Code Section 500-79). Conditional Use Procedures

1. An application for a conditional use shall be filed with the Board of Supervisors c/o Township Secretary, and shall state and provide:

a. The name and address of the Applicant.

b. The name and address of the owner of the real estate to be affected by the proposed conditional use application.

c. A description and location of the tract or parcel on which the conditional use is proposed.

d. A statement of the present zoning classification of the tract or parcel in question, the improvements thereon, and the present use thereof.

e. A statement of the Section of this Ordinance which authorizes the conditional use.

f. An accurate description of the present improvements and the additions intended to be made under the application for conditional use, including the size of proposed improvements, material and general construction features. The application shall be accompanied by a proposed plan showing the size and location of the proposed use, the location of all proposed buildings, all proposed facilities, including access drives and parking areas, and dimensional features demonstrating compliance with the applicable area, width, coverage, yard and design standards.

2. The application for a conditional use shall be filed with the Secretary of the Township on such forms as may be prescribed for that purpose, and shall be accompanied by the application fee, prescribed from time to time, by the Board of Supervisors. No application shall be received for filing unless accompanied by the required filing fee.

3. The Board of Supervisors shall hold a public hearing on the conditional use application in accordance with the procedures set forth in the Pennsylvania Municipalities Planning Code, Article IX:

a. Public notice as defined by this Ordinance shall be given of the hearing. Notice of the hearing shall be conspicuously posted on the affected tract of land at least one (1) week prior to the hearing. The Board of Supervisors shall conduct its first hearing on the application within sixty (60) days from the date the application is filed with the Township Secretary unless the time therefore is extended in writing or on the record by the Applicant.

b. The parties to the hearing shall be the municipality, any person affected by the application who has made timely appearance of the record before the Board of Supervisors, and any other person, including civic or community organizations permitted to appear by the Board. The Board shall have the power to require that all persons who wish to be considered parties enter written appearances on forms provided by the Board for that purpose.

c. The Chairman or Acting Chairman of the Board shall have power to administer oaths and issue subpoenas to compel the attendance of witnesses and the production of relevant documents and papers, including witnesses and documents requested by the parties.

d. Formal rules of evidence shall not apply, but irrelevant, immaterial, or unduly repetitious evidence may be excluded.

e. The Board of Supervisors shall keep a stenographic record of the proceedings. The appearance fee for a stenographer shall be shared equally by the Applicant and the Board. The cost of the original transcript shall be paid by the Board if the transcript is ordered by the Board or shall be paid by the person appealing from the decision of the Board if such appeal is made, and in either event, the cost of additional copies shall be paid by the person requesting such copy or copies. In all other cases the party requesting the original transcript shall bear the cost thereof.

f. The Board shall render a written decision within forty five (45) days after the last hearing before the Board. Where the application is contested or denied, the decision shall be accompanied by findings of fact and conclusions based thereon, together with the reasons therefore.

g. A copy of the final decision shall be delivered to the Applicant and the parties before the Board personally or mailed to them not later than the day following the date of the decision.

4. In granting or denying a conditional use or establishing conditions with reference to such grants, the Board of Supervisors shall use as a guide in evaluating a proposed conditional use, and may determine to be mandatory, the standards listed in subsection 8 below. The burden of establishing compliance with those enumerated standards shall be upon the Applicant by a fair preponderance of the credible evidence. The standards required by this subsection shall be deemed a part of the definitional aspect under which a conditional use may be granted, and the failure of the Applicant to establish his or her compliance with all of the standards shall, in the discretion of the Board, be deemed either a basis for the establishing of conditions or limitations on an approval or the basis for a determination that the Applicant has not met the requirements for which a conditional use may be granted.

5. Nothing in this Section shall be construed to relieve the Applicant for a conditional use approval from obtaining other required approvals mandated by the Township Subdivision and Land Development Ordinance, or other applicable ordinances.

6. Appeals from a determination of the Board pursuant to any application for conditional use shall be only as prescribed within such times permitted by the applicable provisions of the Pennsylvania Municipalities Planning Code.

7. In granting an application for conditional use, the Board may attach such additional reasonable conditions and safeguards as it deems necessary and appropriate to insure compliance with the provisions of this Ordinance and to protect the health, safety and general welfare of the community.

8. The burden of establishing compliance with those enumerated standards below shall be upon the Applicant by a fair preponderance of the credible evidence. The standards required by this sub section shall be deemed a part of the definitional aspect under which a conditional use may be granted, and the failure of the Applicant to establish his or her compliance with all of the standards shall, in the discretion of the Board, be deemed either a basis for the establishing of conditions or limitations on an approval or the basis for a determination that the Applicant has not met the requirements for which a conditional use may be granted. In addition to those standards set forth in the section of

the Ordinance authorizing the conditional use, Applicant shall establish:

a. That the proposed change is consistent with the spirit, purpose, and intent of the Caernarvon Township Comprehensive Plan;

b. That the proposed change will not substantially injure or detract from the use of the neighborhood property or from the character of the neighborhood, and that the use of the property adjacent to the area included in the proposed change or plan is adequately safeguarded;

c. That the proposed change will serve the bests interests of the Township, the convenience of the community, and the public welfare;

d. That the proposed change will not preclude the logical, efficient, and economical extension of public services, and facilities such as public utilities, police and fire protection, and public schools, and assure adequate arrangements for situation in specific instances;

e. That the proposed conditional use relief is suitable for the proposed location to probable effects upon traffic patterns and emergency response, and assure adequate access arrangements will be provided in order to protect roads from undue congestion and hazard;

f. The adequacy of sanitation and public safety provisions, where applicable, and require a certificate of adequacy of sewage and water facilities from the appropriate governmental health agency in any case required herein; and

g. Consider and apply all relevant provisions of the Municipalities Planning Code, including but not limited to 53 P.S. § 10913.2 (relating to conditional uses).

CAERNARVON TOWNSHIP BOARD OF SUPERVISORS

In re: Application of Elverson AD 1, LLC and Jared S. and Marla J. Kurtz	:	No.

SUPPLEMENT TO APPLICATION FOR CONDITIONAL USE

Applicants Elverson AD 1, LLC and Jared S. and Marla J. Kurtz ("Applicants") hereby seek conditional use approval pursuant to Section 543.A.1 of the Caernarvon Township Zoning Ordinance ("Ordinance") to install and operate a regional anaerobic digester on the property located at 4366 Main Street. In support thereof, Applicants provide:

I. BACKGROUND

1. Jared S. and Marla J. Kurtz ("Landowners") are the owners of the property located at 4366 Main Street, Elverson, PA with a tax parcel id # 35533001164380 (the "Property").

2. The Property includes approximately 53.03 acres of land consisting of agricultural land. The Property is used primarily for crop and dairy farming, operated by Tim and Jared Kurtz, and is referred to as Kurtland Farms, LLC. The Property is improved with a farm dwelling, barns and other agricultural buildings. *See* Aerial attached as Exhibit "A."

3. The Property is bisected by Main Street, otherwise known as Route 23. The Property is located in the Effective Agricultural Preservation zoning district. *See* Excerpt from zoning map attached as Exhibit "B."

4. Vanguard Renewables Holdings, LLC ("Vanguard Renewables"), a parent company of applicant Elverson AD 1, LLC ("Elverson AD 1"), collaborates with farmers to develop, build and operate anaerobic digesters. Vanguard Renewables partners with smaller dairy farms, such as Kurtland Farms, which are often excluded from the opportunity of establishing

anaerobic digesters because they do not produce a sufficient amount of manure to operate a digester.

5. Kurtland Farms has evolved and grown from a tie stall dairy operation to a modern robotic milking dairy operation with the construction of a new facility in 2012.

6. Kurtland Farms is looking at opportunities and options for their farm to be competitive in the future. The implementation of a renewable energy project with the construction of an anaerobic digester ("digester") is one of the tools that Kurtland Farms feel would help position the farm for sustainability in the long-run.

7. Anaerobic digestion is a process by which organic material, such as cow manure and food waste, is broken down by microbes in an enclosed environment to produce biogas.

8. In addition to producing renewable energy, the digester also produces agricultural by-products such as liquid fertilizer and solid bedding for use on dairy farms.

9. Across Pennsylvania and throughout the United States, anaerobic digesters have been used on large dairy farms as a common and effective manure management technology that takes advantage of the microbial activity and organic matter in their manure streams to produce large amounts of biogas and useful agricultural by-products.

10. These anaerobic digesters also provide an alternate revenue source to the dairy, increase dairy sustainability, and help reduce odors that come from the land application of manure.

11. Smaller dairy farms, such as Kurtland Farms, generally have been excluded from this type of manure management system because the volume of manure produced is not sufficient to effectively operate an aerobic digester.

12. Kurtland Farms has partnered with Vanguard Renewables to develop an anerobic digester on the Property.

13. Vanguard utilizes co-digestion in their anaerobic digesters which augments the manure streams on medium and smaller-sized dairy farm with food waste, that would otherwise be sent to a landfill.

14. By doing this, a smaller volume of manure can create enough biogas to make the system feasible, allowing family-run dairy farms, like Kurtland Farms, to reap the benefits of this type of system.

15. While examples of anaerobic digesters on larger dairy operations can be found throughout Berks, Lancaster and Chester Counties, there are few examples of smaller dairy operations with digesters.

16. The Berks County Agricultural Land Preservation Board approved the digester being proposed for Kurtland Farms as consistent with the existing agricultural preservation easement for the farm, noting the benefits of the digester to the farm and acknowledging that the state is in favor of the project and recommended that it be recognized as an agricultural project.

II. PROPOSED USE

17. Applicants propose developing a regional anaerobic digester on the Property.

18. Elverson AD 1 will operate the digester under a 20-year ground lease, with the potential option to extend that lease for an additional 20 years in five-year increments.

19. Upon the cessation of onsite operations, Elverson AD 1 will decommission the site in accordance with applicable State and Federal requirements to include the removal of all unprocessed food waste.

20. The digester will utilize co-digestion which augments the available manure from Kurtland Farms with food waste sourced from preapproved food waste suppliers.

21. Food waste will be received and pumped directly into the hydrolysis tanks at the site.

22. No packaged food will be received or stored at the site and no de-packaging facility is proposed for the site.

23. Manure used for the digester will be sourced directly from Kurtland Farms.

24. The agricultural by-products produced by the digester will be used by Kurtland Farms as animal bedding and liquid fertilizer.

25. The biogas produced as a result of the digester will be transported off the Property via a small four (4) inch pipeline.

26. These anaerobic digesters provide an alternate revenue source to the farm, increase dairy sustainability, and help reduce odors that come from the land application of manure.

27. A detailed description of the proposed use of the digester facility is attached as Exhibit "E."

III. PROPOSED RELIEF

28. The Ordinance permits regional anaerobic digesters in the Effective Agricultural Preservation district by conditional use.

29. Applicants meet the specific requirements for establishing a regional anaerobic digester as follows:

a. The lot area is 53.03 acres. §653.1.a.

b. A traffic analysis and transportation study (Traffic Impact Study) is attached hereto as Exhibit "C" and demonstrates the necessary requirements and details the effect of the digester system on local roadways, as well as the effect of vehicle weight, congestion and noise.

§653.1.b. §653.1.c. (While not all of the exhibits appended to the TIS have been attached to this application due to their size, a full copy of the TIS has been provided to the Township Engineer).

c. Long stacking lanes will be provided so that vehicles waiting to load or unload will not backup the public streets. *See* Site Plan attached as Exhibit "D." §653.1.d.

d. A detailed description of the proposed use is attached as Exhibit "E" (and along with testimony to be offered at the hearing) addresses the following items:

i. On-site activities and operations, types of material stored and used, frequency and duration period of storage of materials and methods for use and disposal of materials §653.1.e(1).

ii. The general scale of operation in terms of its market area, specific space and area requirements for each activity, total number of employees of each shift and overall needed site size. §653.1.e(2).

iii. How the anaerobic digester will support the farm on which it resides. § 653.1.e(3).

e. Applicant will provide testimony at the hearing establishing that the anaerobic digester meets the design, installation and maintenance requirements of the Ordinance. § 653.1.f.

i. A letter dated September 11, 2024 from the Berks County Conservation District confirms that it is aware of Applicants' anaerobic digester and that necessary permits will be reviewed by the Conservation District in partnership with other regulatory bodies is attached as Exhibit "F." §653.1.f(5).

ii. An operation and maintenance plan demonstrating that the digester and any membrane system will prevent fugitive emissions and will be maintained in such a manner as to

prevent biogas leaks and resultant fugitive emissions and malodor odors is attached as Exhibit "G." §653.1.f(6).

iii. An odor mitigation plan demonstrating odor control measures and odor control devices to be implemented to control odors and mitigate impact on adjacent property owners is attached as Exhibit "H." §653.1.f(7).

iv. Renderings of the proposed digester establishing that they are consistent with the aesthetics of other agricultural buildings are attached as Exhibit "I." §653.1.f(8)

f. The proposed digester and related improvements meet all setback requirements as shown on the site plan. §653.1.g.

g. The proposed digester meets all height requirements. §653.1.h.

h. At least one parking space will be provided for each employee working at the anaerobic digester facility on the largest shift. *See* Site Plan. §653.1.i.

i. The proposed digester facility will comply with the maximum amount of new impervious surface allowed under the Ordinance. §653.1.j.

j. All food waste used in the digester will be received in a truck and directly pumped into a fully enclosed hydrolysis tank. §653.1.k.

k. All garbage, trash and rubbish will be stored indoors or in an enclosed, screened area not visible to the public or accessible to animals or rodents. §653.1.l.

l. Any biogas generated from the digester will be either used on the Property or transported off the Property via pipeline. The biogas will not be liquified or compressed for purposes of transporting via trucks off the Property. §653.1.m.- n.

m. At least ten percent of the materials inputted into the digester will be manure generated by animals on the Property or from animals kept on adjoining properties. §653.1.o.

n. Landowners will not subdivide the area used for the digester but will enter into a lease agreement with Elverson AD 1. The agreement will not constitute a subdivision for zoning and land development purposes. §653.1.p.

o. There will be no onsite commercial or retail sales of products or byproducts generated by the Digester. §653.1.q.

p. Should the digester become functionally obsolete or is no longer in use, Applicants will comply with all requirements regarding properly decommissioning the digester. §653.1.r.

30. Applicants also meet the general requirements for a conditional use as follows:

a. The proposed use is consistent with the spirit, purpose, and intent of the Caernarvon Township Comprehensive Plan, the Southern Berks Joint Comprehensive Plan and the Berks County Comprehensive Plan (collectively "Comp Plans"). All of these Comp Plans recognize the importance of agricultural operations and the need to protect and preserve the future viability of farms by permitting a wide variety of farm related uses, such as digesters. For example, the Berks County Comprehensive Plan states that "effective agricultural zoning (EAZ) focuses on agriculture by protecting productive farmland, permitting a wide variety of farm-related uses, including supplemental farm businesses and other uses that complement and further the objectives of agricultural land protection..." p. 93. Likewise, the Regional Comprehensive Plan has the follow specific action item: "In rural conservation areas, permit a range of activities that allow opportunities for supplemental income for farms on large tracts of land." p. 197. §705.8.a.

b. The proposed use will not substantially injure or detract from the use of neighborhood property or from the character of the neighborhood.

c. The Site Plan attached as Exhibit "D" details the significant efforts taken to buffer the digester from adjoining properties so as to not affect the use of adjacent properties. §705.8.b.

d. The proposed digester is in the best interests of the Township, the convenience of the community and public welfare. Specifically, it will help by diverting food waste from landfills, reducing odors from the spreading of manure, mitigating greenhouses gases often associated with dairy farming, and tackling water quality and climate concerns. Additionally, it will support the sustainability and viability of family farms for future generations. §705.8.c.

e. The proposed digester will not preclude the logical, efficient and economical extension of public services and facilities such as public utilities, police and fire protection and public schools and assure adequate arrangements for situation in specific instances. §705.8.d.

f. The proposed relief is suitable for the proposed location as the truck traffic is minimum and will not materially affect the traffic patterns or existing conditions on the surrounding roadways. Applicant has provided adequate access for emergency vehicles.

g. Certification of adequate sewage and water facilities from appropriate governmental health agency will be provided as part of the land development plan approval process. §705.8.f

h. All relevant provisions of the Municipalities Planning Code have been considered and applied. §705.8.g.

31. A list and map of the names and addresses of adjoining lot owners is attached as Exhibit "J."

WHEREFORE, Applicants respectfully request that the Caernarvon Township Board of Supervisors hold a hearing and, pursuant to Section 543.A.1, grant Applicants conditional use approval to establish and operate a regional anaerobic digester on the Property as more fully described in this Application.

GIBBEL KRAYBILL & HESS LLP

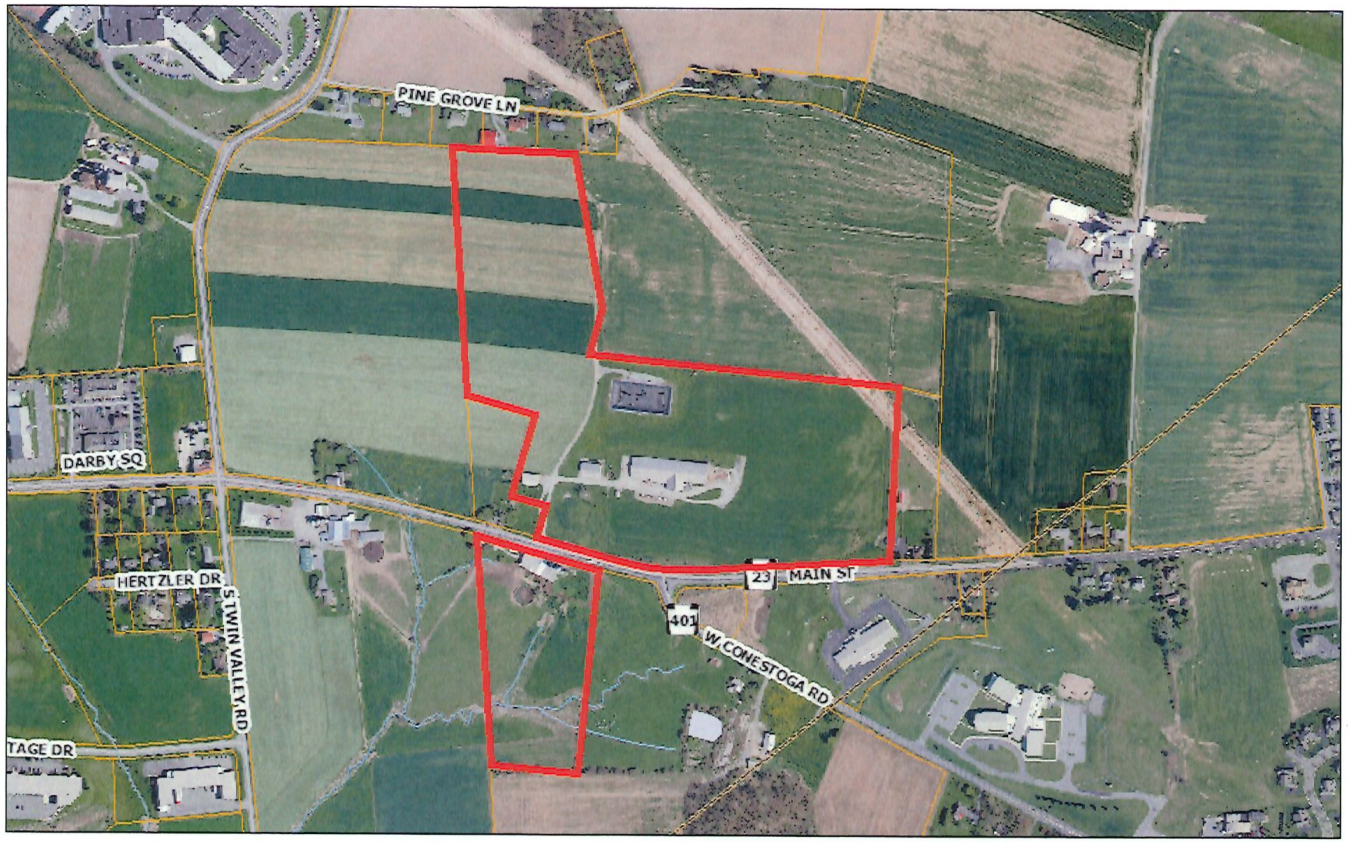
Date: 10/15/2024

By: _____

J. Dwight Yoder
Attorney for Applicants
Sup. Ct. Atty. I.D. #81985
2933 Lititz Pike
PO Box 5349
Lancaster, PA 17606
(717) 291-1700
dyoder@gkh.com

Exhibit A

Berks County



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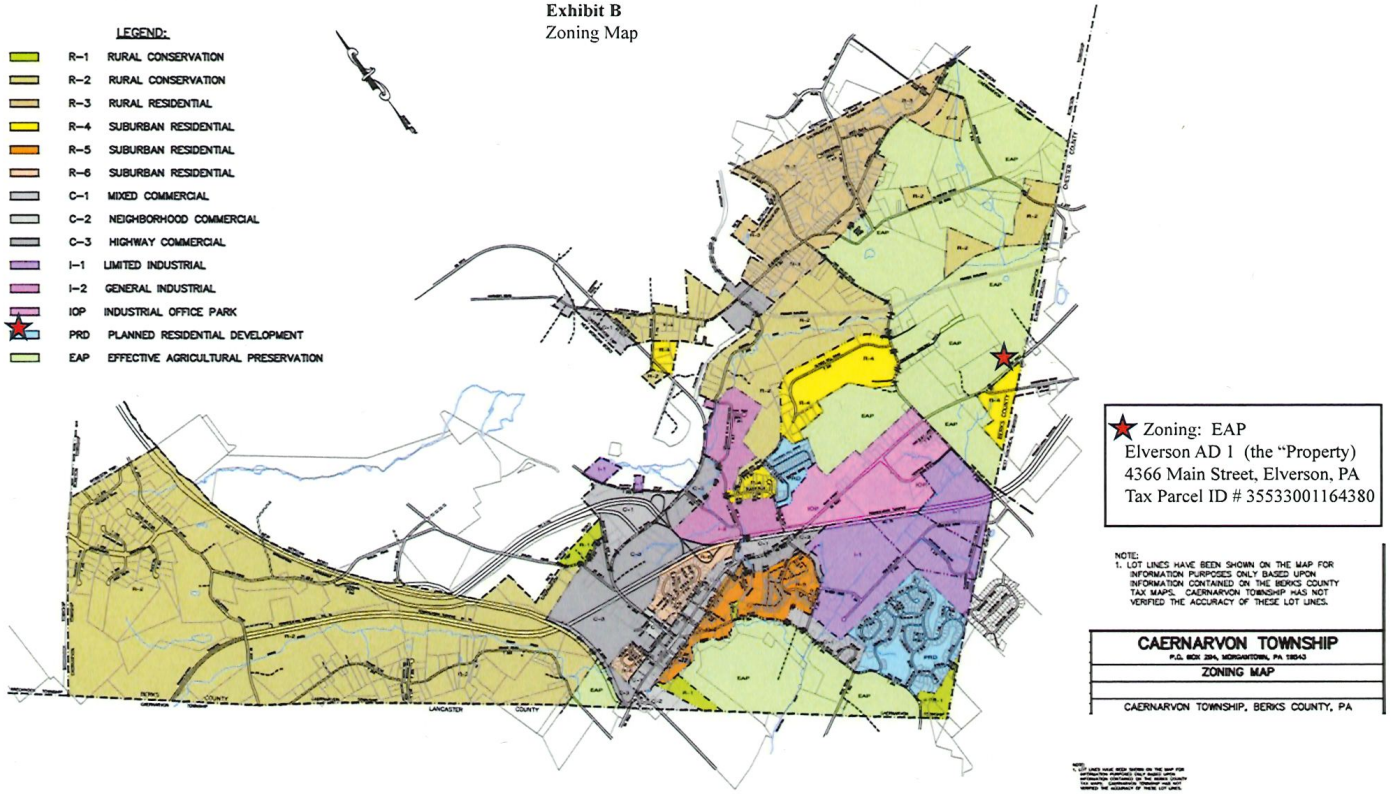
PEMA
County of Berks

Berks County
Berks County

Exhibit B

Exhibit B
Zoning Map



★ Zoning: EAP
Elverson AD 1 (the "Property)
4366 Main Street, Elverson, PA
Tax Parcel ID # 35533001164380

NOTE:
1. LOT LINES HAVE BEEN SHOWN ON THE MAP FOR INFORMATION PURPOSES ONLY BASED UPON INFORMATION CONTAINED ON THE BERKS COUNTY TAX MAPS. CAERNARVON TOWNSHIP HAS NOT VERIFIED THE ACCURACY OF THESE LOT LINES.

CAERNARVON TOWNSHIP
P.O. BOX 294, MORGANTOWN, PA 19543
ZONING MAP
CAERNARVON TOWNSHIP, BERKS COUNTY, PA

Exhibit C

October 10, 2024
TPD# MACK.00010

Est. 1989

TRAFFIC PLANNING AND DESIGN, INC.

Transportation Impact Study

Elverson AD 1 Development
Caernarvon Township, Berks County, PA

For Submission To:
Caernarvon Township &
PennDOT District 5-0

1720 Spillman Drive, Suite 260, Bethlehem, PA 18015 | 610.326.3100 | TPD@TrafficPD.com

ELVERSON AD 1 DEVELOPMENT
TRANSPORTATION IMPACT STUDY

FOR SUBMISSION TO:

Caernarvon Township, Berks County, PA
& PennDOT District 5-0

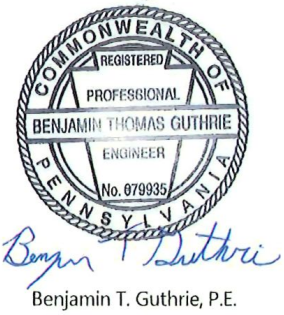
Prepared For:
Elverson AD 1, LLC
133 Boston Post Road
Building 15, 2nd Floor
Weston, MA 02493

Phone: (781) 232-7597

October 10, 2024
TPD # MACK 00010

Est. 1989
TRAFFIC PLANNING AND DESIGN, INC.
Prepared By:
Traffic Planning and Design, Inc.
1720 Spillman Drive, Suite 260
Bethlehem, 18015

Phone: (610) 625-4242
E-mail: TPD@TrafficPD.com
Web Site: www.trafficpd.com



Benjamin T. Guthrie, P.E.
Senior Project Manager

Pennsylvania License Number PE 079935

Table of Contents

FIGURES 1 – 9

TECHNICAL APPENDICES

EXECUTIVE SUMMARY

The purpose of this study is to examine the potential traffic impact associated with the proposed Elverson AD 1 development on the roadway network in Caernarvon Township, Berks County, PA. Based on this evaluation, the following conclusions were reached:

1. The study area intersections included in this TIS are as follows:
   - Main Street (S.R. 0023) & Conestoga Road (S.R. 0401)
   - Main Street (S.R. 0023) & Twin Valley Fire Department Driveway
2. The project site is located on the northern side of Main Street (S.R. 0023) across from the intersection of Main Street (S.R. 0023) & Conestoga Road (S.R. 0401).
3. The proposed site will consist of a codigestor (manure and food waste).
4. Access to the site will be provided via one full-access driveway to Main Street (S.R. 0023). For the purposes of this study, two potential driveway locations were evaluated: (1) a driveway aligned with the existing intersection of Main Street (S.R. 0023) & Conestoga Road (S.R. 0401), and (2) a driveway aligned with the existing Twin Valley Fire Department driveway.
5. Based on the results of this study, TPD recommends that the site driveway be aligned with the existing Twin Valley Fire Department driveway.
6. The available sight distance at the proposed driveway location will exceed PennDOT's Desirable and Safe Stopping Sight Distance (SSSD) criteria.
7. Upon full build-out, the proposed development is expected to generate 7 new vehicle-trips during the weekday A.M. peak hour, and 8 new vehicle-trips during the weekday P.M. peak hour.
8. Under the 2026 projected conditions, all approaches and turning movements at the site driveway intersections will operate at LOS C or better during weekday A.M. and weekday P.M. peak hours.
9. Under 2026 projected (build) conditions, all study area intersections will operate at the same overall intersection level of service (ILOS) as under 2026 base (no-build) conditions during the weekday A.M. and the weekday P.M. peak hours) or have an overall increase in delay of less than 10 seconds.
10. Traffic Planning and Design Inc. (TPD) recommends the following roadway improvements as outlined at the study area intersections:

    ### Main Street (S.R. 0023) & Twin Valley Fire Department/Proposed Site Driveway

    - The proposed driveway approach will be classified and designed as a low volume driveway;
    - Provide a stop sign (PennDOT designation R1-1) to control exiting traffic.

    As part of PennDOT's HOP process, the applicant will coordinate and fund the implementation of the recommended roadway improvements. Preliminary construction costs have not been determined at this time.

11. Levels of Service (LOS) for the study area intersections have been summarized in matrix form. **Table I and Table II** detail the overall intersection LOS for each study area intersection.

TABLE I
LEVEL OF SERVICE DELAY (SECONDS) SUMMARY

Intersection	Movement	Weekday A.M. Peak Hour			
		Existing	Opening Year 2026		
			Base	Access Scenario 1	Access Scenario 2
Main Street (S.R. 0023) & Conestoga Road (S.R. 0401) / Proposed Site Driveway	EB L	--	--	A	--
	WB L	A	A	A	A
	NB LTR	E (37.8)	F (52.3)	F (95.0)	F (54.2)
	SB LTR	--	--	B	--
	ILOS	**A (9.9)**	**B (13.5)**	**C (24.4)**	**B (13.9)**
Main Street (S.R. 0023) & Twin Valley Fire Department Driveway / Proposed Site Driveway	EB L	--	--	--	A
	WB L	A	A	A	A
	NB LTR	A	A	A	A
	SB LTR	--	--	--	B
	ILOS	**A (0.0)**	**A (0.0)**	**A (0.0)**	**A (0.1)**

Base = No-Build scenario / Projected = Build scenario
ILOS = Overall Intersection Level of Service. Unsignalized ILOS calculated in accordance with Figure 5 of Policies and Procedures for Transportation Impact Studies

TABLE II
LEVEL OF SERVICE DELAY (SECONDS) SUMMARY

Intersection	Movement	Weekday P.M. Peak Hour			
		Existing	Opening Year 2026		
			Base	Access Scenario 1	Access Scenario 2
Main Street (S.R. 0023) & Conestoga Road (S.R. 0401) / Proposed Site Driveway	EB L	--	--	A	--
	WB L	B	B	B	B
	NB LTR	F (75.1)	F (117.4)	F (192.3)	F (124.2)
	SB LTR	--	--	C	--
	ILOS	**C (17.4)**	**D (27.4)**	**E (44.6)**	**D (28.8)**
Main Street (S.R. 0023) & Twin Valley Fire Department Driveway / Proposed Site Driveway	EB L	--	--	--	A
	WB L	A	A	A	A
	NB LTR	B	B	B	C
	SB LTR	--	--	--	B
	ILOS	**A (0.0)**	**A (0.0)**	**A (0.0)**	**A (0.1)**

Base = No-Build scenario / Projected = Build scenario
ILOS = Overall Intersection Level of Service. Unsignalized ILOS calculated in accordance with Figure 5 of Policies and Procedures for Transportation Impact Studies

INTRODUCTION

Traffic Planning and Design, Inc. (TPD) has completed a Transportation Impact Study (TIS) for the proposed Elverson AD 1 development in Caernarvon Township, Berks County, Pennsylvania. The project site is located on the northern side of Main Street (S.R. 0023), across from the intersection of Main Street (S.R. 0023) & Conestoga Road (S.R. 0401) as shown in **Figure 1**. As shown in **Figure 2**, the proposed site will consist of a codigestor (manure and food waste). The land use context of the site and surrounding area is defined as rural in the Smart Transportation Guidebook, dated March 2008.

This report has been prepared in accordance with PennDOT's *Policies and Procedures for Transportation Impact Studies*, found in PennDOT's Publication 282, Appendix A, dated September 2022. The project scope and the extent of the study area were confirmed with representatives of PennDOT and Township staff via a scoping application submission on May 8, 2023. All relevant correspondence pertaining to this project has been included in **Appendix A**.

Site Access Location

Access to the site will be provided via one full-access driveway to Main Street (S.R. 0023). For the purposes of this study, two potential driveway locations were evaluated: (1) a driveway aligned with the existing intersection of Main Street (S.R. 0023) & Conestoga Road (S.R. 0401), and (2) a driveway aligned with the existing Twin Valley Fire Department driveway.

Based on the results of this study, TPD recommends that the site driveway be aligned with the existing Twin Valley Fire Department driveway.

EXISTING ROADWAY NETWORK

A field review of the existing roadway system in the study area was conducted. The existing roadway characteristics within the study area are summarized in **Table 1**. The existing lane configuration and intersection controls for the study area intersections are shown in **Figure 3**. Photographs of the study area intersections are included in **Appendix B**.

TABLE 1
ROADWAY CHARACTERISTICS WITHIN STUDY AREA

Roadway	Ownership	Functional Classification/ Roadway Type	Predominant Directional Orientation	Average Daily Traffic	Posted Speed Limit
Main Street	State (S.R. 0023)	Minor Arterial	East-West	7,960	45 mph
Conestoga Road	State (S.R. 0401)	Major Collector	East-West	6,563	45 mph

Land Use Context

In Section 1.2 of the Design Manual, Part 2, there is guidance pertaining to defining the land use context(s) for a given area. Based upon review of this information, the land uses surrounding the proposed site best fits the Rural designation, as described below:

***Rural**, "consists of few houses and structures dotting a farm or forest landscape. The areas are*

predominately wetlands, woodlands, meadow or cultivated land. Small markets, gas stations, diners, farm supplies, convenience grocers, etc. are often seen at the intersections of arterial or collector road . . . .Once the population of the settled area exceeds 250, it should be classified in the town/village context."

Roadway Type

In Section 1.2 of the Design Manual, Part 2, there is guidance pertaining to defining the transportation context(s) for a given area. Comparing the existing condition roadway characteristics to the various options presented in Table 1.2, the study area roadways best fit the following categories, as described below:

Community Arterial, traffic volumes of 5,000 to 25,000 vehicles per day, intersection spacing of 300 to 1,320 feet, a desired operating speed of 25-55 mph, and a description as follows: *"often classified as Minor Arterial in traditional classification but may include road segments classified as Principal Arterial."*

- Main Street (S.R. 0023)

Community Collector, traffic volumes of 5,000 to 15,000 vehicles per day, intersection spacing of 300 to 660 feet, a desired operating speed of 25-55 mph, and a description as follows: *"often similar in appearance to a community arterial. Typically classified as Major Collector."*

- Conestoga Road (S.R. 0401)

Bicycle and Pedestrian Facilities

There are no sidewalks or bike lanes on Main Street (S.R. 0023) or Conestoga Road (S.R. 0401) in the vicinity of the proposed development.

Mass Transit Facilities

Public transportation is not available in the vicinity of the proposed development.

EXISTING TRAFFIC CONDITIONS

Intersection Turning Movement Counts

Intersection traffic counts were conducted on 15-minute intervals during the weekday morning (6:00 to 9:00 A.M.) and weekday evening (2:00 to 6:00 P.M.) peak periods. Data pertaining to heavy vehicles and pedestrians was also recorded during the turning movement counts. Peak hours and count dates for the study area intersections are identified in **Table 2**.

TABLE 2
TRAFFIC COUNT INFORMATION

Intersection	Date of Traffic Counts	Time Period	Intersection Peak Hour[1]
Main Street (S.R. 0023) & Conestoga Road (S.R. 0401)	Tuesday, April 9, 2024	Weekday A.M.	7:15 – 8:15 A.M.
		Weekday P.M.	3:30 – 4:30 P.M.
Main Street (S.R. 0023) & Twin Valley Fire Department Driveway	Tuesday, April 9, 2024	Weekday A.M.	7:15 – 8:15 A.M.
		Weekday P.M.	4:00 – 5:00 P.M.

1 – Peak hour consists of the four consecutive 15-minute intervals where the highest traffic volumes occur.

Existing condition traffic volumes for the weekday A.M. and weekday P.M. peak hours are illustrated in **Figure 4**. Traffic count data sheets are provided in **Appendix C**.

TRUCK APPROACH ROUTES

To assess the effect of the regional anaerobic digester system on local roadways, TPD identified likely routes from the nearest limited access highways to and from the proposed facility ("approach routes"). Trucks traveling to and from the proposed development site will likely utilize one of two approach routes to and from I-76 Exit 298 and I-176 Exit 1, as described below. Photographs and maps of both approach routes are included in **Appendix D**.

Approach Route A

To utilize Approach Route A, vehicles would exit from I-76 or I-176 and travel east on Morgantown Road (S.R. 0010) for 0.6 miles. Vehicles would turn right onto Morgan Way and travel south of 0.7 miles to the signalized intersection with Main Street (S.R. 0023). Vehicles would turn left on Main Street (S.R. 0023) and travel 1.8 miles to reach the site.

Roadway and Bridge Conditions

The approach route includes the Main Street (S.R. 0023) bridge over I-76, the Morgan Way underpass under I-76, the Morgan Way bridge over the East Branch of the Conestoga River, and the Morgantown Road (S.R. 0010) underpass under I-176. Based on a field assessment, there are no vertical clearance restrictions, weight limits, or other constrictive roadway deficiencies.

Traffic Congestion

TPD reviewed the Reading Area Transportation Study Congestion Management Process, adopted November 9, 2023. None of the roadway sections on Approach Route A was identified as part of the CMP Network.

Land Uses

East of Morgan Way, Main Street (S.R. 0023) is a suburban corridor primarily serving commercial land uses. Morgan Way is a local road primarily serving light industrial land uses. Morgantown Road (S.R. 0010) passes through undeveloped land between Morgan Way and the I-176 interchange.

Intersection Turning Radii

Based upon field observations, all intersection turning radii appear to be adequate at each of the intersections along the approach route. No encroachment on opposing travel lanes or off-tracking of wheels by trucks was observed.

Horizontal Alignment

The horizonal alignment and lane widths on the approach route are appropriate to accommodate truck traffic.

Roadside Clear Zone

Shoulders are provided on Main Street (S.R. 0023) between the proposed site access and Morgan Way. No shoulders are provided on Morgan Way, a local road with a posted speed of 30 mph. Limited truck traffic was observed utilizing Morgan Way. No indication of off-tracking was observed. Shoulders are provided on Morgantown Road (S.R. 0010) between Morgan Way and the I-176 interchange.

Grades

There are no locations along the approach route where long steep grades would cause undue vehicle delay.

Under Clearance
TPD did not observe any locations along the approach route which would present under clearance problems for vehicles traveling to/from the facility.

Environmental Impacts
Based upon field inspection, there are no land uses such as parks, playgrounds, recreation areas, forests, picnic areas, natural landmarks, wild areas, wetlands, public water supplies, or historic sites that will experience adverse environmental impacts as a result of the increased traffic to and from the proposed facility.

Approach Route B

To utilize Approach Route B, vehicles would exit from I-76 or from I-176 and travel southwest on Morgantown Road (S.R. 0010) for 1.0 miles. Vehicles would turn left onto Main Street (S.R. 0023) and travel 2.4 miles to reach the site.

Roadway and Bridge Conditions
The approach route includes the Main Street (S.R. 0023) bridge over I-76, the Morgantown Road (S.R. 0010) overpass under I-76, and the Morgantown Road (S.R. 0010) underpass under I-176. Based on a field assessment, there are no vertical clearance restrictions, weight limits, or other constrictive roadway deficiencies.

Traffic Congestion
TPD reviewed the Reading Area Transportation Study Congestion Management Process, adopted November 9, 2023. Morgantown Road (S.R. 0010) was identified as part of the CMP Network.

Land Uses
East of Morgan Way, Main Street (S.R. 0023) is a suburban corridor primarily serving commercial land uses. West of Morgan Way, Main Street (S.R. 0023) passes through Morgantown, a census-designated place where the land use pattern can be described as a town/village neighborhood with a mix of residential and commercial land uses. The Caernarvon Township municipal building is located on Main Street. Morgantown Road (S.R. 0010) transitions from the town/village neighborhood land use to a suburban corridor land use pattern, passing by commercial uses and a casino. The Twin Valley Recreation Association pool is accessed from Morgantown Road and is set back approximately 300 feet from the roadway.

Intersection Turning Radii
Based upon field observations, all intersection turning radii appear to be adequate at each of the intersections along the approach route. No encroachment on opposing travel lanes or off-tracking of wheels by trucks was observed.

Horizontal Alignment
The horizonal alignment and lane widths on the approach route are appropriate to accommodate truck traffic.

Roadside Clear Zone
Shoulders are provided on Main Street (S.R. 0023) between the proposed site access and Morgantown Road (S.R. 0010). Shoulders are provided on Morgantown Road (S.R. 0010) between Main Street (S.R. 0023) and the I-176 interchange.

Grades
There are no locations along the approach route where long steep grades would cause undue vehicle delay.

Under Clearance
TPD did not observe any locations along the approach route which would present under clearance problems for vehicles traveling to/from the facility.

Environmental Impacts
Based upon field inspection, there are no land uses such as parks, playgrounds, recreation areas, forests, picnic areas, natural landmarks, wild areas, wetlands, public water supplies, or historic sites that will experience adverse environmental impacts as a result of the increased traffic to and from the proposed facility.

BASE (NO-BUILD) CONDITIONS

Annual Background Growth

A background growth factor for the roadways in the study area was developed based on growth factors for August 2023 to July 2024 obtained from the PennDOT Bureau of Planning and Research (BPR). The PennDOT BPR suggests using a background growth trend factor of 0.57% per year in Berks County for rural non-interstate roadways. As such, the background growth factor was applied annually to yield overall growth percentages of 1.14% (0.57% per year, compounded over 2 years) for the 2026 opening year.

Nearby Proposed Developments

Base (no-build) traffic conditions were calculated to include traffic volumes from proposed developments, which, though not operating under existing conditions, may be operating by the 2026 opening year of the proposed development. The following nearby planned development was specifically included in this study:

Magnolia Greene is a proposed development located on the northern side of Main Street (S.R. 0023), just east of Willow Glen Road, on the site of the Morgantown Airport. The development is assumed to consist of 134 single-family dwellings, 86 townhomes, a 6,899 square foot (SF) automobile parts store, a 6,640 SF sit-down restaurant, a 3,060 SF fast-food restaurant with drive-thru, and a 9,900 SF office building. Access is proposed via three proposed driveways to Main Street (S.R. 0023). Trip generation calculations for this development were developed based on data provided in the scoping application number S0520220069, which was submitted August 10, 2023. TPE assumed that 25% of new trips would travel to/from the east along Main Street (S.R. 0023) through the study area.

The additional traffic volumes due to background growth and nearby developments were added to the existing traffic data to produce 2026 base (no-build) condition traffic volumes. Base condition volumes for the weekday A.M. and weekday P.M. peak hours are illustrated in **Figure 5**. Information related to the background development is provided in **Appendix E**.

SCHEDULED ROADWAY IMPROVEMENTS

Programmed Improvements

Based on a review of the Pennsylvania Transportation Improvement Program (TIP) there are no programmed roadway improvements in the vicinity of the proposed site.

PROPOSED SITE ACCESS

Access to the site will be provide via one full-access driveway to Main Street (S.R. 0023). For the purposes of this study, two potential driveway locations were evaluated: (1) a driveway aligned with the existing intersection of Main Street (S.R. 0023) & Conestoga Road (S.R. 0401), and (2) a driveway aligned with the existing Twin Valley Fire Department driveway.

Sight Distance Analysis

A sight distance analysis was prepared for the proposed site driveway scenarios. In general, recommended safe sight distances depend upon the posted speed limit and roadway grades. The existing sight distances at the proposed driveways were measured in accordance with PennDOT Publication 282 Highway Occupancy Permit Operations Manual and compared to PennDOT's desirable sight distance standard, which is identified in 67 PA Code Chapter 441.8(h), "Access to and Occupancy of Highways by Driveways and Local Roads." In addition, measured sight distances at the proposed driveways were compared to PennDOT's safe stopping sight distance standard, which is calculated by the following equation:

$$SSSD = 1.47VT + V^2/[30(f \pm g)]$$

SSSD = safe stopping sight distance (acceptable sight distance)
V = Vehicle Speed
T = Perception Reaction Time of Driver (2.5 seconds)
f = Coefficient of Friction for Wet Pavements
g = Percent of Roadway Grade Divided by 100

Tables 3-4 show the measured, desirable, acceptable (SSSD), and required sight distances at the site driveways for vehicles entering and exiting the site.

TABLE 3
SIGHT DISTANCE ANALYSIS – ACCESS SCENARIO 1
SITE DRIVEWAY TO MAIN STREET (S.R. 0023) ALIGNED WITH CONESTOGA ROAD (S.R. 0401)

	Direction	Speed	Grade[1]	Sight Distances (feet)		
				DES	SSSD	EXIST
Exiting Movements	To the left	45 mph	-1%	635'	390'	**460'**
	To the right	45 mph	0%	570'	383'	**580'**
Entering Left Turns	Approaching same direction	45 mph	0%	--	383'	**530'**
	Approaching opposite direction	45 mph	-1%	445'	390'	**700'**

DES = PennDOT Desirable Sight Distance *1 = Roadway Grade Approaching Driveway*
SSSD = PennDOT Acceptable Sight Distance *EXIST = Existing (measured) Sight Distance*

As shown in **Table 3** above, if the site driveway were aligned with Conestoga Road (S.R. 0401), the measured sight distances at the proposed driveway will exceed PennDOT's desirable sight distance requirements, with the exception of exiting movements looking to the left. It appears that sight distance for that turning movement could be improved with the removal of vegetation along the site frontage.

TABLE 4
SIGHT DISTANCE ANALYSIS – ACCESS SCENARIO 2
SITE DRIVEWAY TO MAIN STREET (S.R. 0023) ALGINED WITH TWIN VALLEY FIRE DEPARTMENT

	Direction	Speed	Grade[1]	Sight Distances (feet)		
				DES	SSSD	EXIST
Exiting Movements	To the left	45 mph	-4%	635'	415'	800'
	To the right	45 mph	+1%	570'	376'	700'
Entering Left Turns	Approaching same direction	45 mph	+1%	--	376'	770'
	Approaching opposite direction	45 mph	-4%	445'	415'	770'

DES = PennDOT Desirable Sight Distance
SSSD = PennDOT Acceptable Sight Distance
1 = Roadway Grade Approaching Driveway
EXIST = Existing (measured) Sight Distance

As shown in **Table 4** above, if the site driveway were aligned with the Twin Valley Fire Department driveway, the measured sight distances at the proposed driveway will exceed PennDOT's desirable sight distance requirements.

TRIP GENERATION

The trip calculations for the proposed development were based on information provided to TPD by Elverson AD 1. Based on information provided to TPD, the proposed codigestor will have approximately 10 employees and may generate up to 25 truck trips per day. This would yield a total of 70 trips per day (35 enter, 35 exit).

For comparison, TPD reviewed data in the *Trip Generation Manual*, Eleventh Edition, 2021, an Institute of Transportation Engineers (ITE) Informational Report. TPD reviewed data for Land Use Code 170 (Utility). This land use code includes similar uses such as water supply or sewage treatment, and the data set includes several sites with 1 to 20 employees. Therefore, for the purposes of this study, the trip generation calculations for the weekday A.M. and weekday P.M. peak hours are based on published data for Land Use Code 170. The resulting calculations are generally consistent with the estimates provided to TPD. The trip generation calculations are summarized in **Table 5**.

TABLE 5
TRIP GENERATION CALCULATIONS

Land Use Code	Time Period	Equations/Rates	Entering %	Site Generated Trips		
				Total	Enter	Exit
Utility (#170)	Weekday A.M. Peak Hour	T = 0.71*(X)	87%	7	6	1
	Weekday P.M. Peak Hour	T = 0.75*(X)	14%	8	1	7
	Weekday	N/A [1]	50%	70	35	35

T = number of site-generated vehicular trips
X = independent variable (employees)
1 = Utilized data provided by Elverson AD 1, as documented in PennDOT scoping application.

Based on the trip generation analysis summarized in **Table 5**, the development will generate approximately 7 new trips during the weekday A.M. peak hour and 8 new trips during the weekday P.M. peak hour.

Seasonal Farm Equipment Traffic

At the existing farm driveway, there is seasonal traffic related to manure spreading during brief periods in March through May and September through November. With the construction of the proposed digestor, this seasonal farm equipment traffic is expected to increase. More information regarding the vehicles utilized for this purpose is included in **Appendix F**. This farm equipment access occurs during brief seasonal periods and therefore not included in the typical daily traffic.

TRIP DISTRIBUTION

The distribution of trips generated by the proposed development was based on existing traffic patterns at the intersection of Main Street (S.R. 0023) & Conestoga Road (S.R. 0401). The site trips for the proposed development were distributed to the local roadway network based on the percentages shown in **Table 6**.

TABLE 6
TRIP DISTRIBUTION PERCENTAGES

Direction (To/From)	Assignment (To/From)	Distribution Percentage
East	via Main Street (S.R. 0023)	25%
West	via Main Street (S.R. 0023)	50%
South	via Conestoga Road (S.R. 0401)	25%

The assignment of site-generated trips for the proposed development during the weekday A.M. and weekday P.M. peak hours are shown in **Figures 6-7**.

PROJECTED (BUILD) CONDITION TRAFFIC VOLUMES

The site-generated trips for the proposed development were added to the 2026 base (no-build) condition traffic volumes to develop 2026 projected (build) condition traffic volumes.

Projected condition traffic volumes for the opening year of 2026 for the weekday A.M. and weekday P.M. peak hours are shown in **Figures 8-9**. Traffic volume development worksheets are contained in **Appendix G**.

DRIVEWAY CLASSIFICATION

Driveways intersecting state roads are classified in the Pennsylvania Code, Title 67, Chapter 441. Low volume driveways are used by 25 to 750 vehicles per day. A medium volume driveway is used by 750 to 1500 vehicles per day. High volume driveways are used by more than 1500 vehicles per day. Based on the anticipated site trip generation and the assignment of site traffic, the classification of the site driveway intersecting Main Street (S.R. 0023) is listed in **Table 7.** The driveway classification is the same for both access scenarios.

TABLE 7
DRIVEWAY CLASSIFICATION

State Road	Weekday Trips	Weekday Vehicles	Driveway Type
Main Street (S.R. 0023)	70	35	Low Volume

Note: A "trip" equals an entering or a exiting vehicle. Therefore, weekday vehicles = weekday trips/2

LEVELS OF SERVICE FOR AN INTERSECTION

For analysis of intersections, level of service is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. LOS criteria is stated in terms of control delay per vehicle for a one-hour analysis period. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The criteria are shown in **Table 8**. Delay, as it relates to level of service, is a complex measure and is dependent upon a number of variables. For signalized intersections, these variables include the quality of vehicle progression, the cycle length, the green time ratio, and the volume/capacity ratio for the lane group in question. For unsignalized intersections, delay is related to the availability of gaps in the flow of traffic on the major street and the driver's discretion in selecting an appropriate gap for a particular movement from the minor street (straight across, left or right turn).

TABLE 8
LEVEL OF SERVICE CRITERIA
UNSIGNALIZED AND SIGNALIZED INTERSECTIONS[1]

Level of Service	Control Delay Per Vehicle (Seconds)	
	Signalized	Unsignalized
A	< 10	< 10
B	> 10 and < 20	> 10 and < 15
C	> 20 and < 35	> 15 and < 25
D	> 35 and < 55	> 25 and < 35
E	> 55 and < 80	> 35 and < 50
F	> 80 or v/c > 1.0	> 50 or v/c > 1.0

1 = Obtained from Exhibits 19-8 and 20-2 of the Transportation Research Board's Highway Capacity Manual 6th Edition.

CAPACITY ANALYSIS METHODOLOGY

Capacity analyses were conducted for the weekday A.M. and weekday P.M. peak hours at the study area intersections. These analyses were conducted according to the methodologies contained in the *Highway Capacity Manual 6th Edition* (HCM) using *Synchro 11* software, a Trafficware product.

The following conditions were analyzed, as applicable:

- Existing conditions;
- 2026 Base conditions (Build-out year without development);
- 2026 Projected conditions – Access Scenario #1 (Build-out year with development);
- 2026 Projected conditions – Access Scenario #2 (Build-out year with development).

In addition, capacity analyses were conducted at the proposed site driveway intersections under the 2026 projected conditions. The capacity analysis worksheets are included in **Appendix H.**

PennDOT's Transportation Impact Study Guidelines outlined in PennDOT's *Policies and Procedures for Transportation Impact Studies*, found in PennDOT's Publication 282, Appendix A, dated September 2022 contain the following criteria regarding levels of service:

- Page 29 of the Guidelines state that if evaluation of the With Development Horizon Year Scenario to the Without Development Horizon Year Scenario indicates that the overall intersection level of service has dropped, the applicant will be required to mitigate the level of service if the increase in overall intersection delay is greater than 10-seconds. If the overall intersection delay increase is less than or equal to 10-seconds, mitigation of the intersection will not be required.
- Page 29 of the Guidelines state that for mitigation scenarios, applicants are expected to mitigate the overall intersection LOS to the original Without Development LOS; the 10-second delay variance is not applied to mitigation scenarios. Applicants may be required to address available storage and queue lengths at critical movements or approaches even if the overall LOS requirements are met.
- Page 31 of the Guidelines state that if signalization is the preferred alternative for mitigation, overall intersection LOS C in rural areas and LOS D in urban areas is acceptable.
- Page 31 of the Guidelines states new signalized or unsignalized intersection established to serve as access to the development shall be designed to operate at minimum LOS C for rural areas, and minimum LOS D for urban areas.

LEVELS OF SERVICE IN THE STUDY AREA

Level of service (LOS) matrices for the study area intersections are shown in **Tables 9 and 10** for the weekday A.M. and weekday P.M. peak hours.

TABLE 9
LEVEL OF SERVICE DELAY (SECONDS) SUMMARY

Intersection	Movement	Weekday A.M. Peak Hour			
		Existing	Opening Year 2026		
			Base	Access Scenario 1	Access Scenario 2
Main Street (S.R. 0023) & Conestoga Road (S.R. 0401) / Proposed Site Driveway	EB L	--	--	A	--
	WB L	A	A	A	A
	NB LTR	E (37.8)	F (52.3)	F (95.0)	F (54.2)
	SB LTR	--	--	B	--
	ILOS	**A (9.9)**	**B (13.5)**	**C (24.4)**	**B (13.9)**
Main Street (S.R. 0023) & Twin Valley Fire Department Driveway / Proposed Site Driveway	EB L	--	--	--	A
	WB L	A	A	A	A
	NB LTR	A	A	A	A
	SB LTR	--	--	--	B
	ILOS	**A (0.0)**	**A (0.0)**	**A (0.0)**	**A (0.1)**

Base = No Build scenario / Projected = Build scenario
ILOS = Overall Intersection Level of Service; Unsignalized ILOS calculated in accordance with Figure 5 of Policies and Procedures for Transportation Impact Studies.

TABLE 10
LEVEL OF SERVICE DELAY (SECONDS) SUMMARY

Intersection	Movement	Weekday P.M. Peak Hour			
		Existing	Opening Year 2026		
			Base	Access Scenario 1	Access Scenario 2
Main Street (S.R. 0023) & Conestoga Road (S.R. 0401) / Proposed Site Driveway	EB L	--	--	A	--
	WB L	B	B	B	B
	NB LTR	F (75.1)	F (117.4)	F (192.3)	F (124.2)
	SB LTR	--	--	C	--
	ILOS	**C (17.4)**	**D (27.4)**	**E (44.6)**	**D (28.8)**
Main Street (S.R. 0023) & Twin Valley Fire Department Driveway / Proposed Site Driveway	EB L	--	--	--	A
	WB L	A	A	A	A
	NB LTR	B	B	B	C
	SB LTR	--	--	--	B
	ILOS	**A (0.0)**	**A (0.0)**	**A (0.0)**	**A (0.1)**

Base = No-Build scenario / Projected = Build scenario
ILOS = Overall Intersection Level of Service. Unsignalized ILOS calculated in accordance with Figure 5 of Policies and Procedures for Transportation Impact Studies

As shown in **Tables 9-10**, under Access Scenario #1, where the driveway is aligned with Conestoga Road, the overall intersection level of service (ILOS) would degrade from a LOS B to a LOS C during the weekday A.M. peak hour, and from a LOS D to a LOS E during the weekday P.M. peak hour.

Under Access Scenario #2, all study area intersections will operate at the same overall intersection level of service (ILOS) under 2026 base (no-build) conditions and under 2026 projected (build) conditions. All approaches and turning movements at the site driveway intersections will operate at LOS C or better during weekday A.M. and weekday P.M. peak hours.

95TH PERCENTILE QUEUE ANALYSIS

Queue analyses were conducted at the study area intersections using *Synchro 11* software. The queue analysis results are summarized in **Tables 11-12** for the analyzed peak hours.

TABLE 11
95TH PERCENTILE QUEUE (FEET) SUMMARY

Intersection	Movement	Weekday A.M. Peak Hour		
		Opening Year 2026		
		Base	Access Scenario 1	Access Scenario 2
Main Street (S.R. 0023) & Conestoga Road (S.R. 0401) / Proposed Site Driveway	EB L	--	<25	--
	WB L	<25	<25	<25
	NB LTR	205	288	210
	SB LTR	--	<25	--
Main Street (S.R. 0023) & Twin Valley Fire Department Driveway / Proposed Site Driveway	EB L	--	--	<25
	WB L	<25	<25	<25
	NB LTR	<25	<25	<25
	SB LTR	--	--	<25

Base = No-Build scenario / Projected = Build scenario

TABLE 12
95TH PERCENTILE QUEUE (FEET) SUMMARY

Intersection	Movement	Weekday A.M. Peak Hour		
		Opening Year 2026		
		Base	Access Scenario 1	Access Scenario 2
Main Street (S.R. 0023) & Conestoga Road (S.R. 0401) / Proposed Site Driveway	EB L	--	<25	--
	WB L	<25	<25	<25
	NB LTR	323	410	333
	SB LTR	--	<25	--
Main Street (S.R. 0023) & Twin Valley Fire Department Driveway / Proposed Site Driveway	EB L	--	--	<25
	WB L	<25	<25	<25
	NB LTR	<25	<25	<25
	SB LTR	--	--	<25

Base = No-Build scenario / Projected = Build scenario

Queue analysis worksheets are included with the capacity analysis worksheets provided in **Appendix H**.

AUXILIARY TURN LANE ANALYSIS

TPD evaluated auxiliary turn lane warrants at the site access intersections based on the methodology contained within Chapter 11 of PennDOT's *Publication 46*, Section 11.17. The results are summarized in **Table 13**.

TABLE 13
AUXILIARY TURN LANE ANALYSIS SUMMARY

Intersection	Auxiliary Lane	Warrant Satisfied?	Required Lane Length	Proposed Lane Length
Main Street (S.R. 0023) & Proposed Site Driveway	EB Left-Turn Lane	No	--	--
	WB Right-Turn Lane	No	--	--

The calculations for the auxiliary turn lane warrants are included in **Appendix I**.

SIGNAL WARRANT ANALYSIS

TPD conducted a traffic signal warrant analysis was conducted at the intersection of Main Street (S.R. 0023) & Conestoga Road (S.R. 0401) in accordance with PennDOT Publication 212, *Official Traffic Control Devices*, Subchapter D, "Highway Traffic Signals".

The analysis was based on intersection turning movement counts conducted on April 9, 2024, from 6:00 A.M. to 7:00 P.M. The following conditions were evaluated:

- Warrant 1A, Minimum Vehicular Volume
- Warrant 1B, Interruption of Continuous Traffic
- Warrant 2, Four-Hour Vehicular Volume Warrant

Warrant 1A - Minimum Vehicular Volume

Warrant 1A, Minimum Vehicular Volume, is satisfied when, for each of any 8 hours of an average day, the traffic volumes on the major street exceed 350 vehicles per hour (both approaches) and the traffic volumes on the higher volume minor street or driveway approach to the intersection equal or exceed 105 vehicles per hour (one approach).

Warrant 1B - Interruption of Continuous Traffic

Warrant 1B, Interruption of Continuous Traffic, is satisfied when, for each of any 8 hours of an average day, the traffic volumes on the major street exceed 525 vehicles per hour (both approaches) and the traffic volumes on the higher volume minor street or driveway approach to the intersection equal or exceed 53 vehicles per hour (one approach).

Warrant 2 - Four-Hour Vehicular Volume

Warrant 2, Four-Hour Volume, is satisfied when for each of any four hours of an average day, the volumes are plotted on a graph which is provided as part of the warrant. If the plotted points all fall above the curve on the graph, then the warrant is met.

Based on the analyses performed, the following are the results of the traffic signal warrants analyzed at the intersection of Main Street (S.R. 0023) & Conestoga Road (S.R. 0401) based on **existing conditions (without development)** traffic volumes:

- Warrant 1A: required volumes reached for 13 hours, 8 hours needed (satisfied);
- Warrant 1B: required volumes reached for 13 hours, 8 hours needed (satisfied);
- Warrant 2: exceeds threshold volumes for 13 hours, 4 hours needed (satisfied);

It is important to note that PennDOT has jurisdiction over all traffic signalization in the state of Pennsylvania; and thus, PennDOT will need to review and approve the traffic signal plans. In addition, in Pennsylvania, municipalities own and maintain the signal equipment; and thus, the municipality must be the Applicant to PennDOT for the signalization.

All relevant signal warrant analyses worksheets are included in **Appendix J**.

RECOMMENDATIONS

TPD has made the following recommendations in relation to the proposed development in Caernarvon Township:

Main Street (S.R. 0023) & Twin Valley Fire Department/ Proposed Site Driveway

- The proposed driveway approach will be classified and designed as a low volume driveway;
- Provide a stop sign (PennDOT designation R1-1) to control exiting traffic.

As part of PennDOT's HOP process, the applicant will coordinate and fund the implementation of the recommended roadway improvements. Preliminary construction costs have not been determined at this time.

CONCLUSIONS

Based on the results of the transportation impact study, TPD offers the following conclusions:

1. The study area intersections included in this TIS are as follows:
   - Main Street (S.R. 0023) & Conestoga Road (S.R. 0401)
   - Main Street (S.R. 0023) & Twin Valley Fire Department driveway
2. The project site is located on the northern side of Main Street (S.R. 0023) across from the intersection of Main Street (S.R. 0023) & Conestoga Road (S.R. 0401).
3. The proposed site will consist of a codigestor (manure and food waste).
4. Access to the site will be provided via one full-access driveway to Main Street (S.R. 0023). For the purposes of this study, two potential driveway locations were evaluated: (1) a driveway aligned with the existing intersection of Main Street (S.R. 0023) & Conestoga Road (S.R. 0401), and (2) a driveway aligned with the existing Twin Valley Fire Department driveway.
5. Based on the results of this study, TPD recommends that the site driveway be aligned with the existing Twin Valley Fire Department driveway.

6. The available sight distance at the proposed driveway location will exceed PennDOT's Desirable and Safe Stopping Sight Distance (SSSD) criteria.

7. Upon full build-out, the proposed development is expected to generate 7 new vehicle-trips during the weekday A.M. peak hour, and 8 new vehicle-trips during the weekday P.M. peak hour.

8. Under the 2026 projected conditions, all approaches and turning movements at the site driveway intersections will operate at LOS C or better during weekday A.M. and weekday P.M. peak hours.

9. Under 2026 projected (build) conditions, all study area intersections will operate at the same overall intersection level of service (ILOS) as under 2026 base (no-build) conditions during the weekday A.M. and the weekday P.M. peak hours) or have an overall increase in delay of less than 10 seconds.

10. With the implementation of the site-related recommendations, it is TPD's opinion that the construction of the proposed development will not adversely affect the health, safety, and welfare of the community from a traffic engineering perspective.

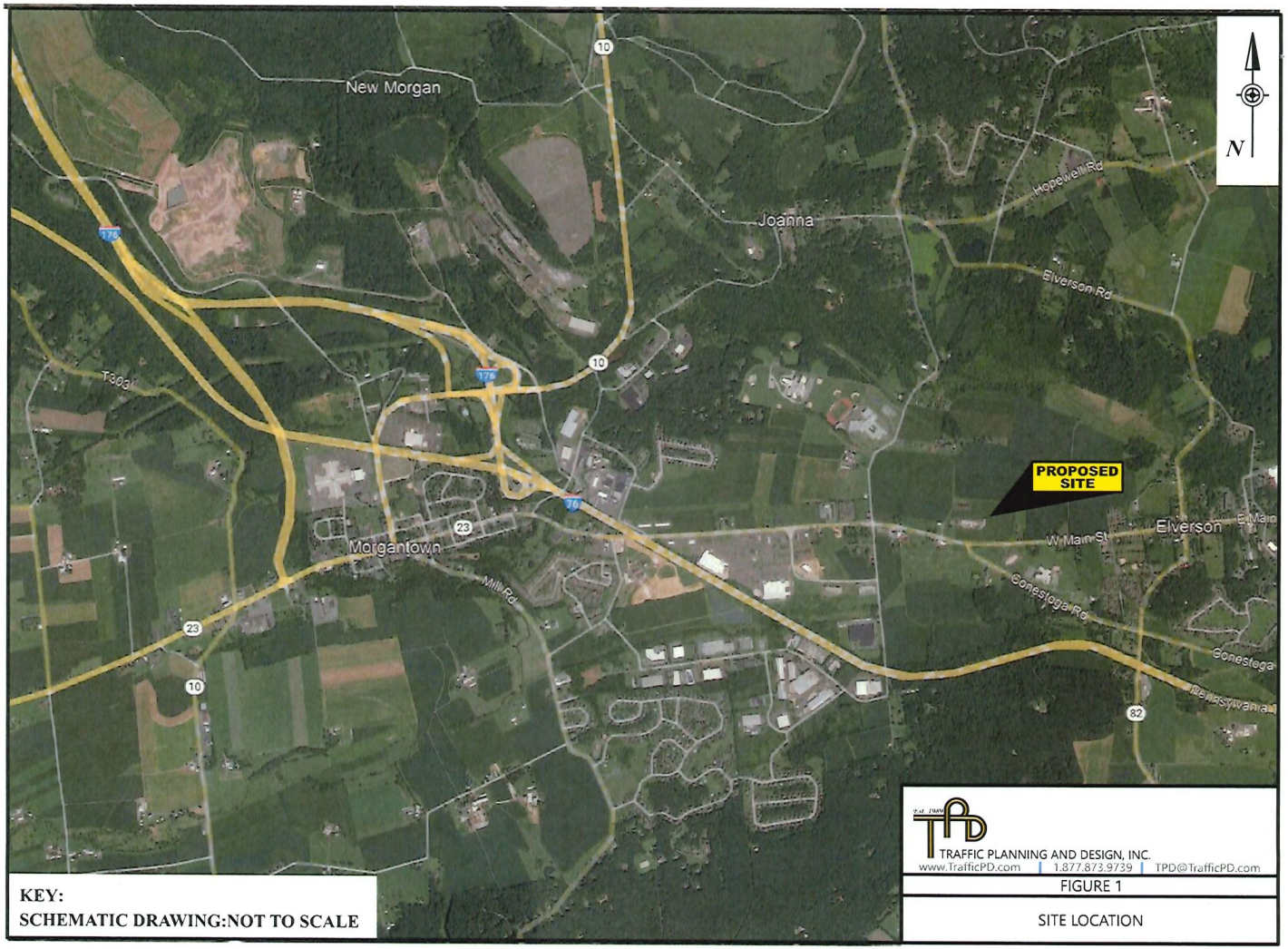

New Morgan
Joanna
Hopewell Rd
Elverson Rd
PROPOSED SITE
Elverson
E Main
W Main St
Morgantown
Mill Rd
Conestoga Rd
Conestoga
Pennsylvania
N
KEY:
SCHEMATIC DRAWING:NOT TO SCALE
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FIGURE 1
SITE LOCATION

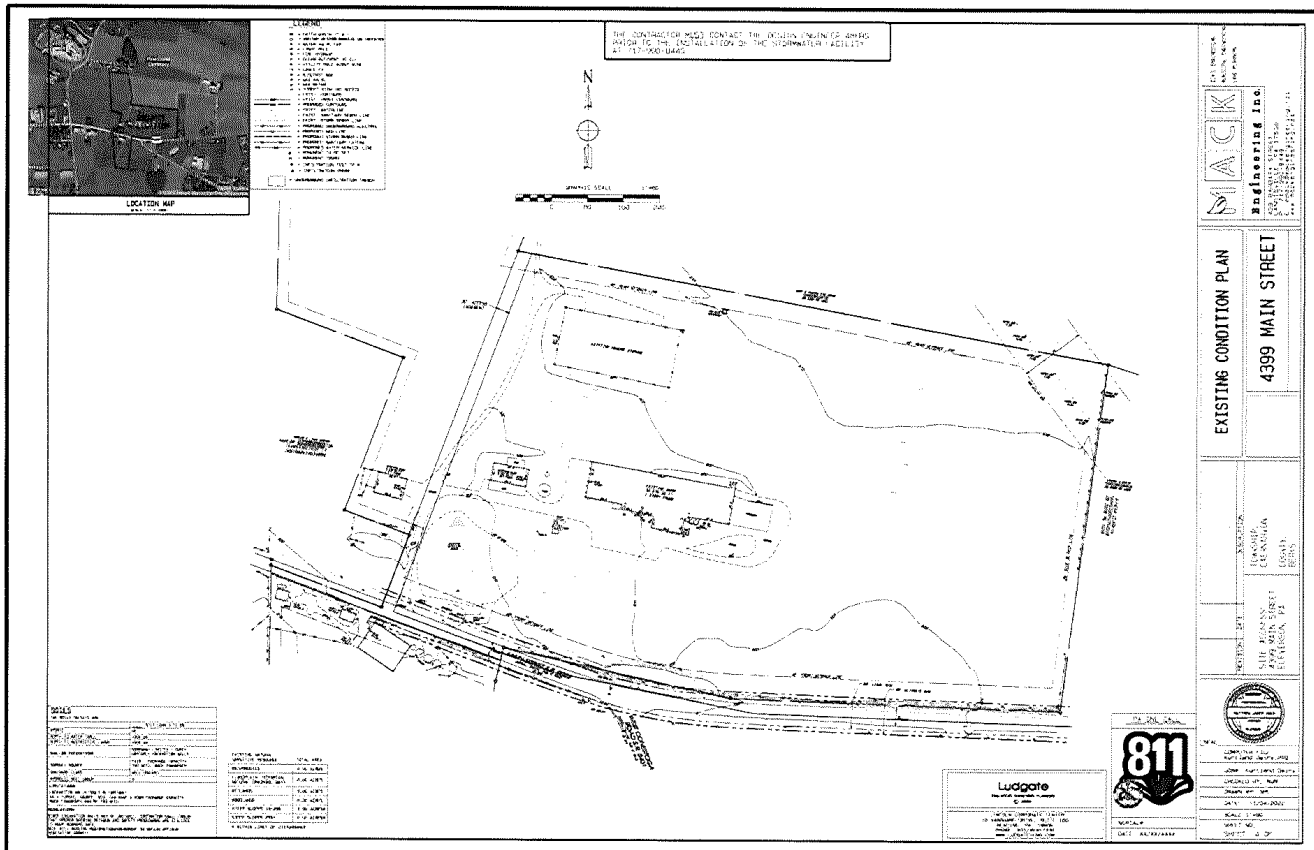

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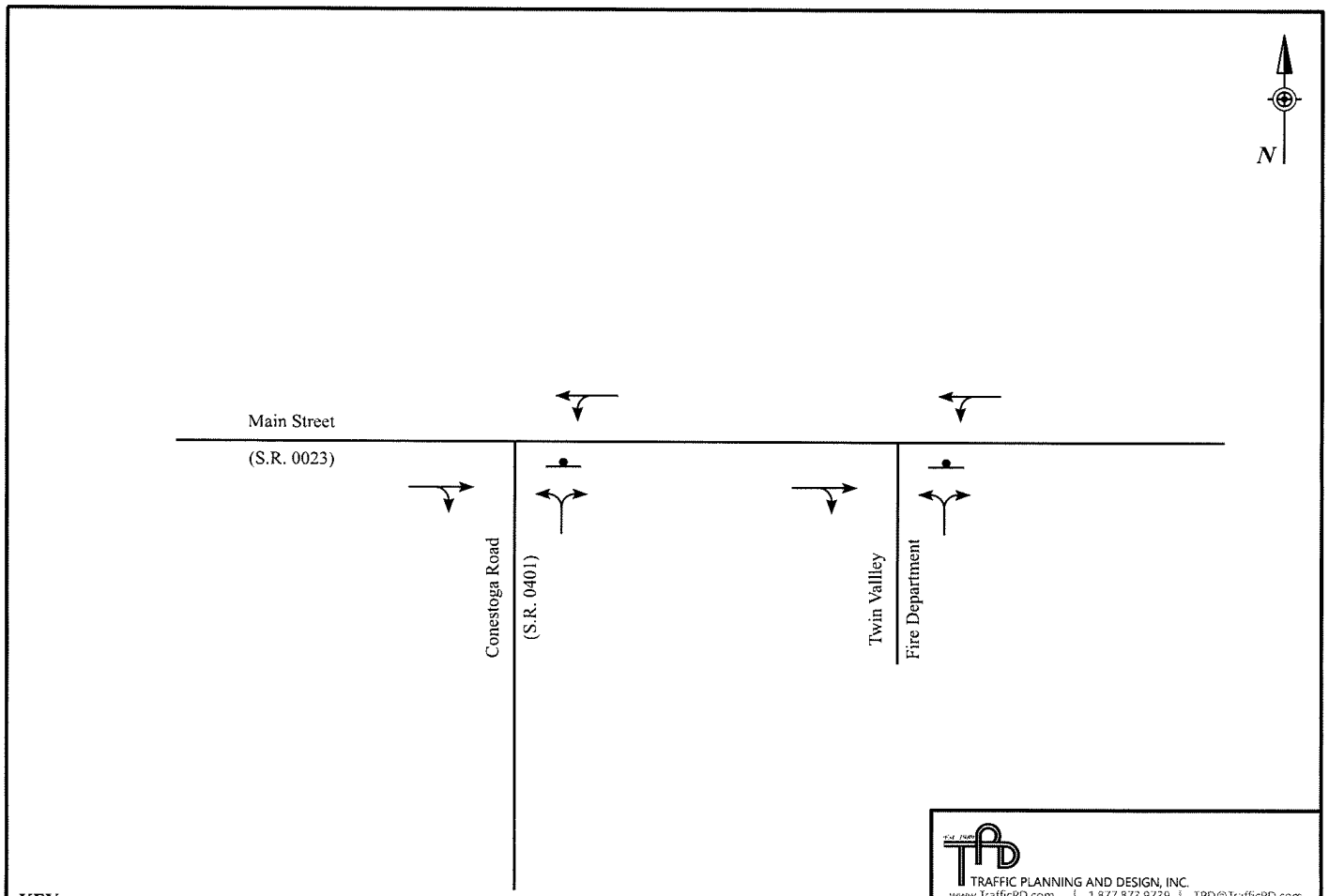
FIGURE 2

PRELIMINARY SITE PLAN

KEY:
SCHEMATIC DRAWING:NOT TO SCALE



KEY:

— **STOP CONTROLLED**

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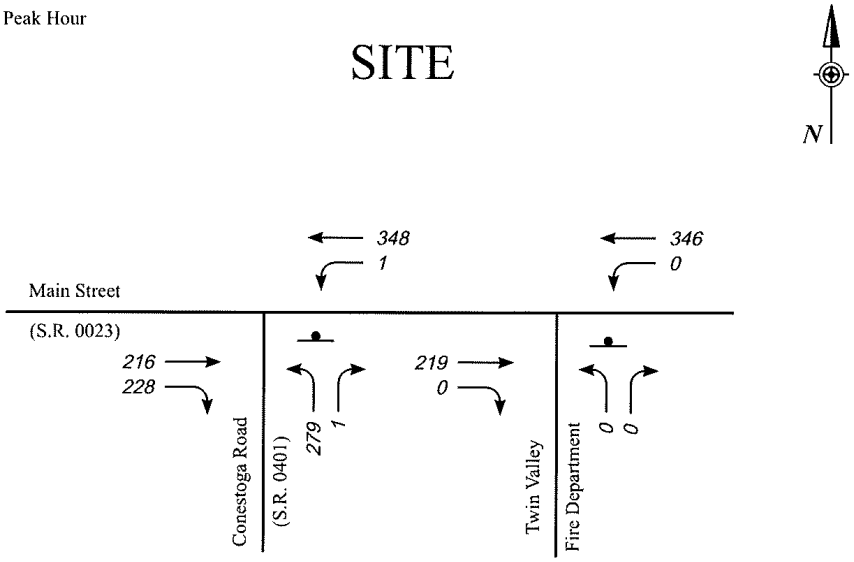
FIGURE 3

2024 EXISTING LANE CONFIGURATION

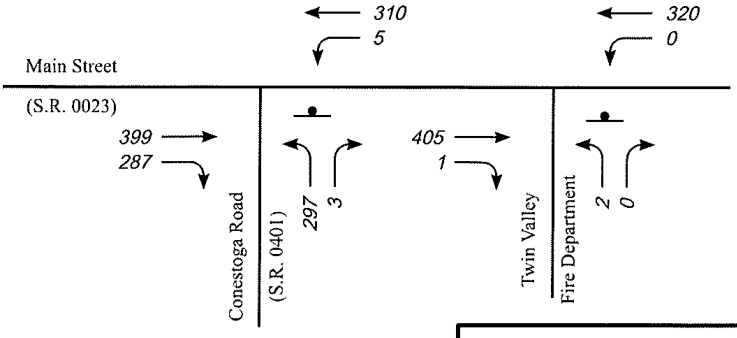
Weekday A.M. Peak Hour

SITE



Weekday P.M. Peak Hour

SITE



KEY:

STOP CONTROLLED

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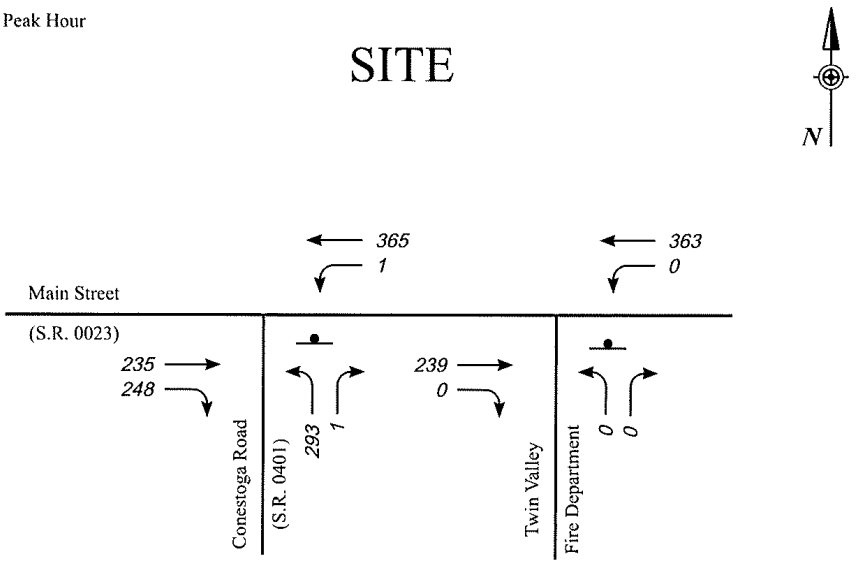
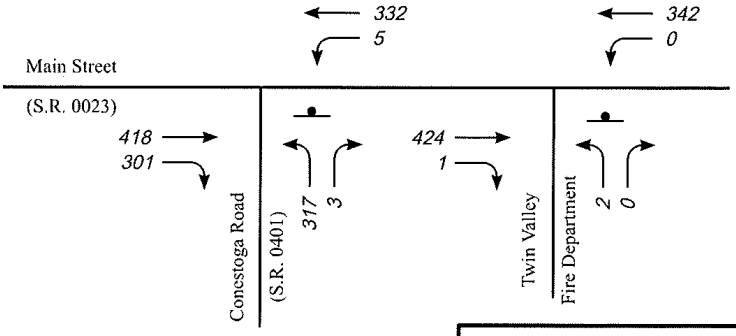
FIGURE 4

2024 EXISTING CONDITIONS
TRAFFIC VOLUMES

Weekday A.M. Peak Hour



Weekday P.M. Peak Hour



KEY:

STOP CONTROLLED

SCHEMATIC DRAWING:NOT TO SCALE

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FIGURE 5

2026 BASE CONDITIONS
TRAFFIC VOLUMES

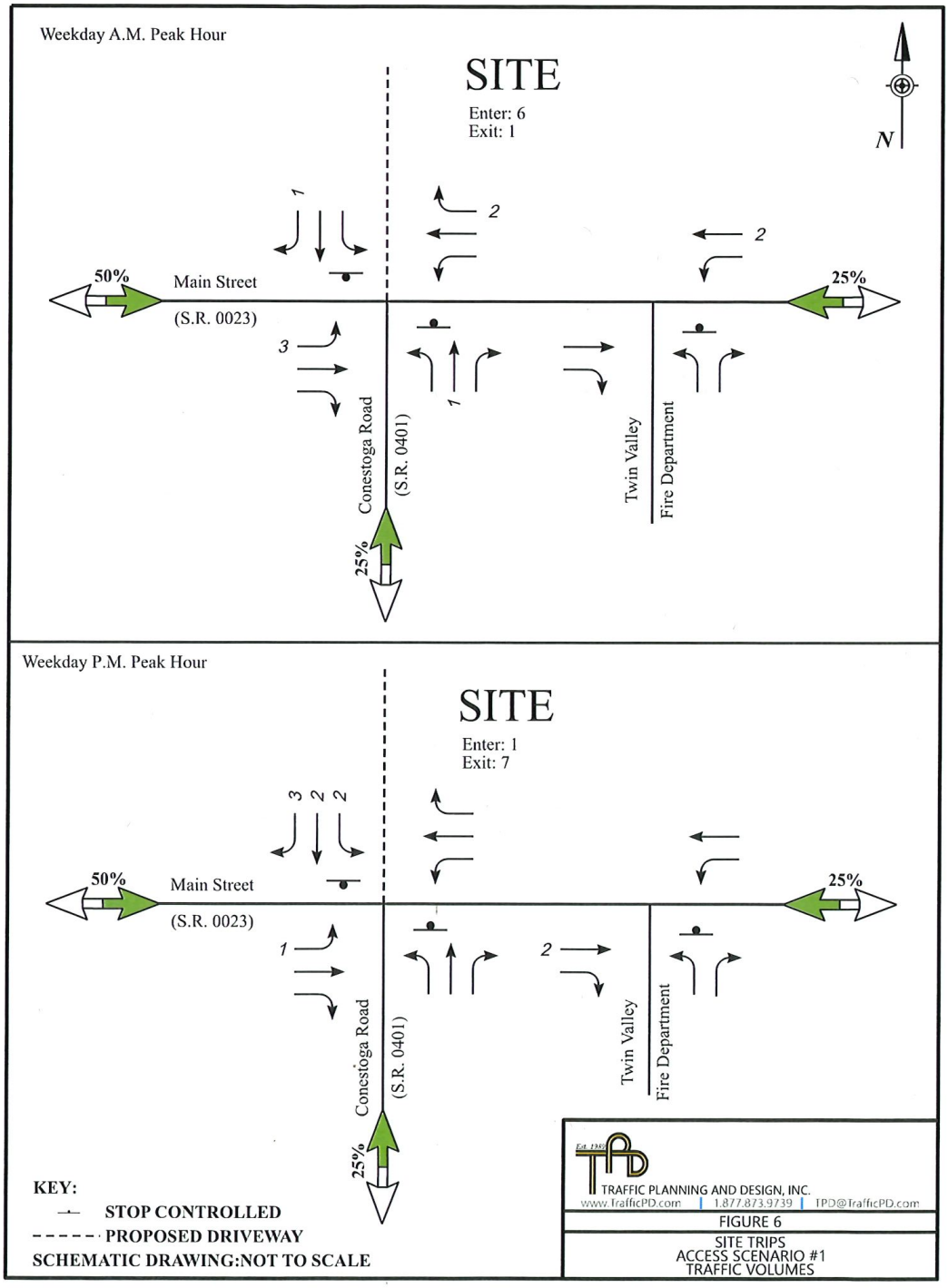
Weekday A.M. Peak Hour
SITE
Enter: 6
Exit: 1
N
50%
Main Street
(S.R. 0023)
25%
Conestoga Road
(S.R. 0401)
25%
Twin Valley
Fire Department
Weekday P.M. Peak Hour
SITE
Enter: 1
Exit: 7
50%
Main Street
(S.R. 0023)
25%
Conestoga Road
(S.R. 0401)
25%
Twin Valley
Fire Department
KEY:
STOP CONTROLLED
PROPOSED DRIVEWAY
SCHEMATIC DRAWING:NOT TO SCALE
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FIGURE 6
SITE TRIPS
ACCESS SCENARIO #1
TRAFFIC VOLUMES

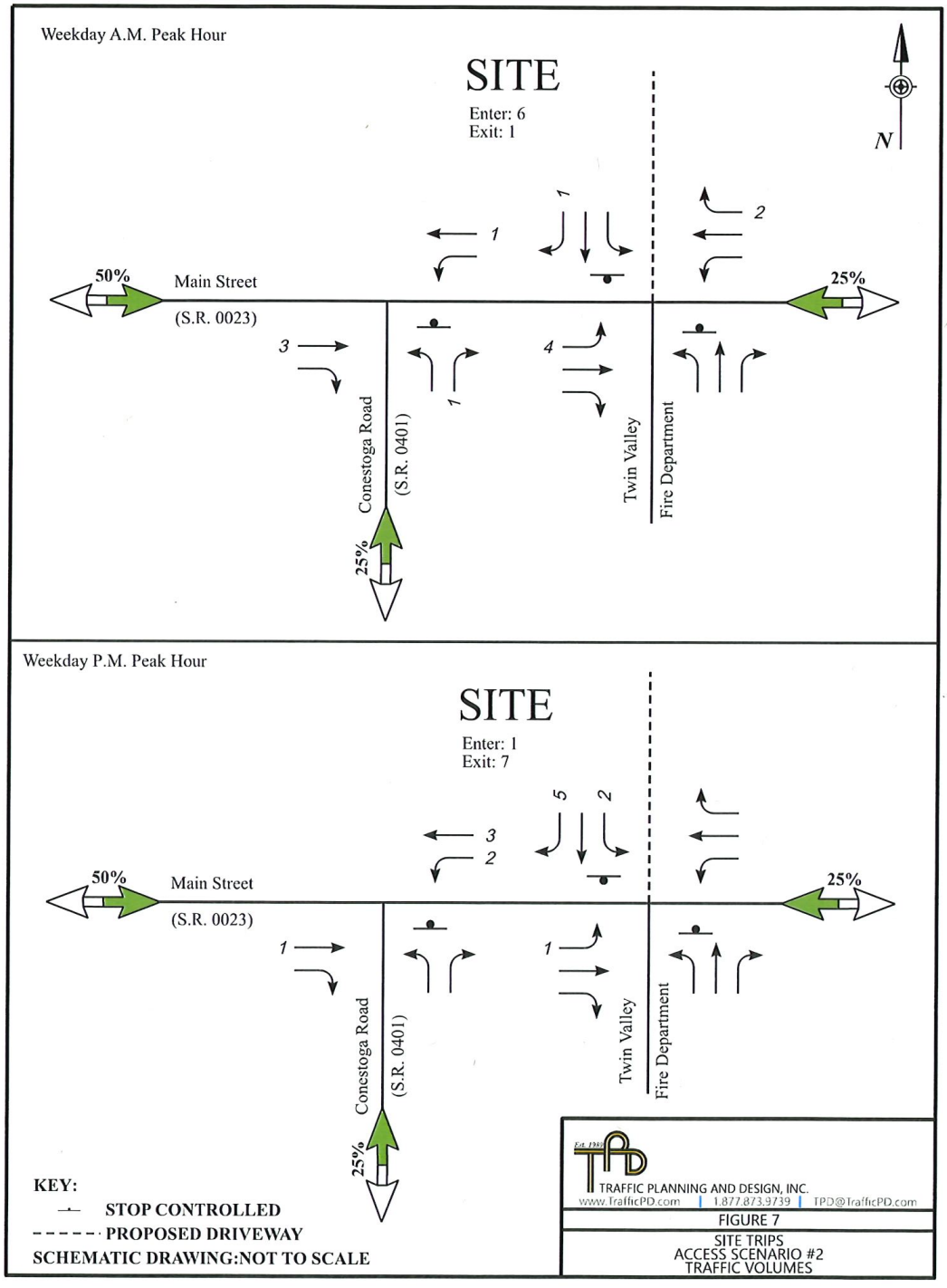
Weekday A.M. Peak Hour
SITE
Enter: 6
Exit: 1
N
50%
Main Street
(S.R. 0023)
25%
Conestoga Road
(S.R. 0401)
25%
Twin Valley
Fire Department
Weekday P.M. Peak Hour
SITE
Enter: 1
Exit: 7
50%
Main Street
(S.R. 0023)
25%
Conestoga Road
(S.R. 0401)
25%
Twin Valley
Fire Department
KEY:
STOP CONTROLLED
PROPOSED DRIVEWAY
SCHEMATIC DRAWING:NOT TO SCALE
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FIGURE 7
SITE TRIPS
ACCESS SCENARIO #2
TRAFFIC VOLUMES

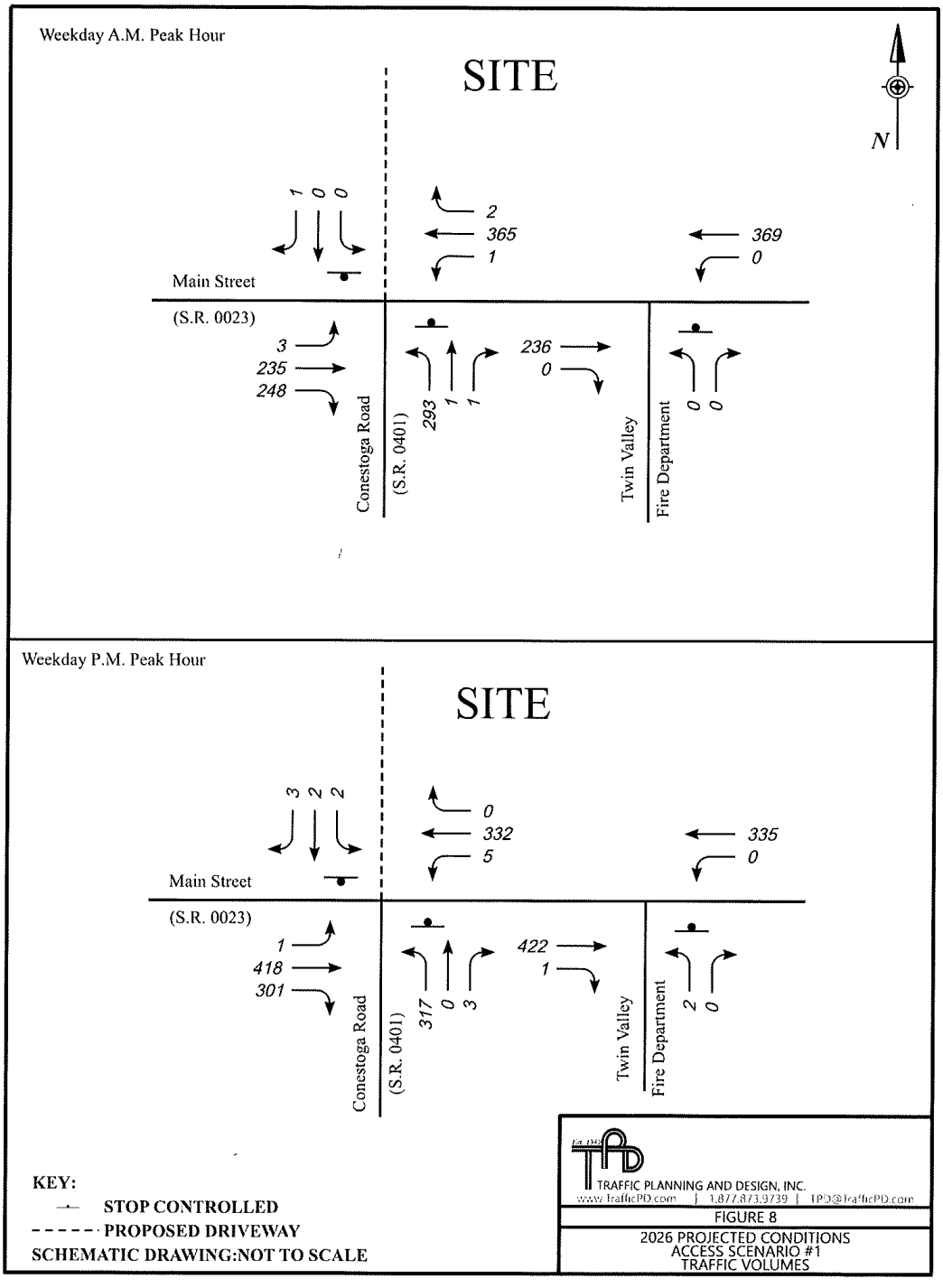
Weekday A.M. Peak Hour
SITE
N
1 0 0
2
365
1
369
0
Main Street
(S.R. 0023)
3
235
248
Conestoga Road
(S.R. 0401)
293
1
1
236
0
Twin Valley
Fire Department
0 0
Weekday P.M. Peak Hour
SITE
3 2 2
0
332
5
335
0
Main Street
(S.R. 0023)
1
418
301
Conestoga Road
(S.R. 0401)
317
0
3
422
1
Twin Valley
Fire Department
2 0
KEY:
STOP CONTROLLED
PROPOSED DRIVEWAY
SCHEMATIC DRAWING:NOT TO SCALE
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FIGURE 8
2026 PROJECTED CONDITIONS
ACCESS SCENARIO #1
TRAFFIC VOLUMES

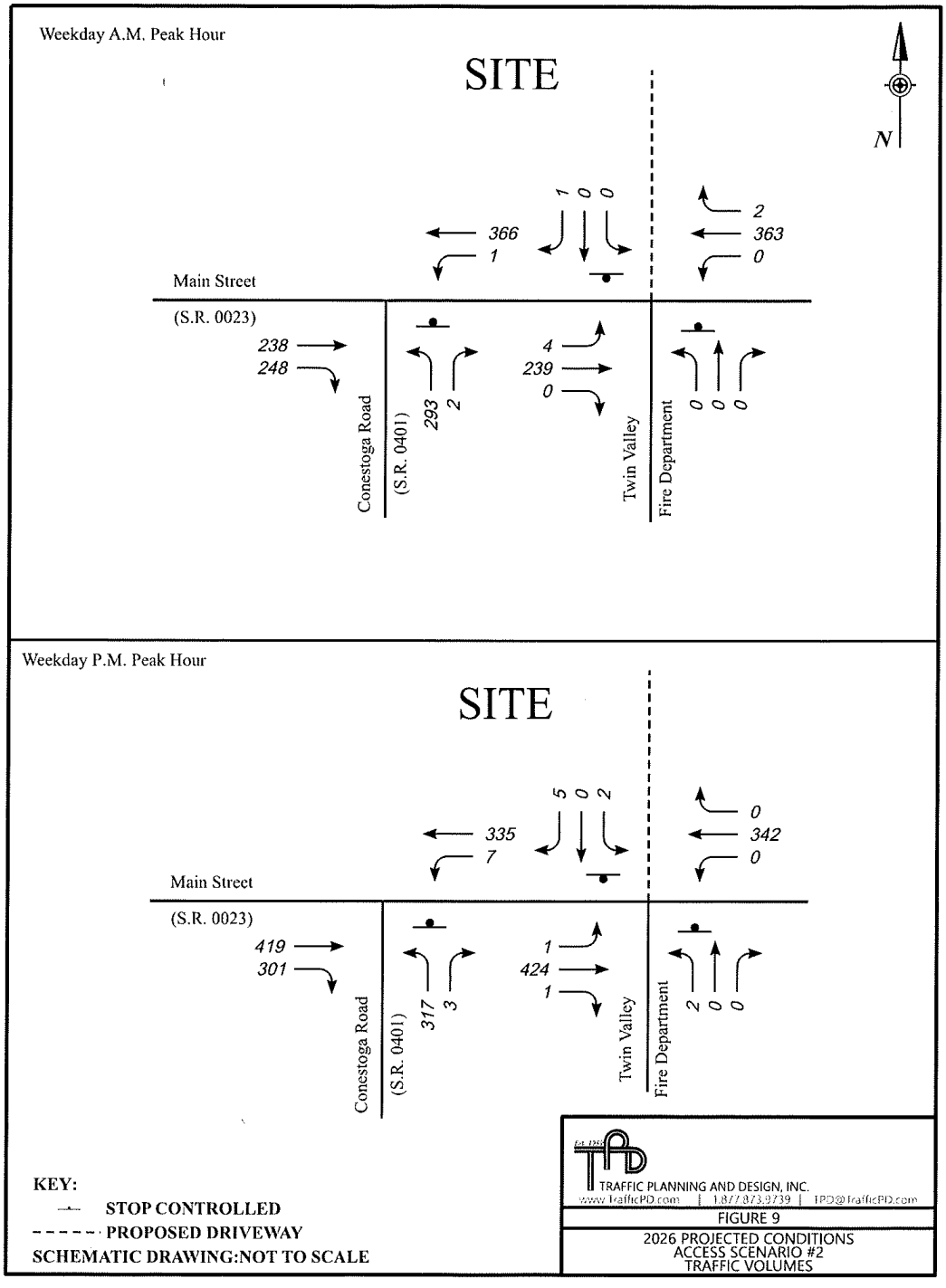
Weekday A.M. Peak Hour
SITE
N
366
1
1 0 0
2
363
0
Main Street
(S.R. 0023)
238
248
293
2
4
239
0
0 0 0
Conestoga Road
(S.R. 0401)
Twin Valley
Fire Department
Weekday P.M. Peak Hour
SITE
335
7
5 0 2
0
342
0
Main Street
(S.R. 0023)
419
301
317
3
1
424
1
2 0 0
Conestoga Road
(S.R. 0401)
Twin Valley
Fire Department
KEY:
STOP CONTROLLED
PROPOSED DRIVEWAY
SCHEMATIC DRAWING:NOT TO SCALE
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FIGURE 9
2026 PROJECTED CONDITIONS
ACCESS SCENARIO #2
TRAFFIC VOLUMES

APPENDIX A:

Project Correspondence

Below are the applications submitted in 2023 to PennDOT. The applicant name has since been changed to the project specific entity, Elverson AD 1, LLC, and contact information has changed. However, we are leaving it in its original form.

pennsylvania
DEPARTMENT OF TRANSPORTATION

TRANSPORTATION IMPACT STUDY (TIS) DETERMINATION & SCOPING MEETING APPLICATION

Scoping Meeting Application:

Received

Scoping Meeting Date:

Scoping Number: S0520220128

Tax Parcel Number:

Project/Development Name: Elverson AD1

Applicant Information:

Business Partner ID:

Applicant Name: Vanguard Organics LLC

Phone: (781) 232-7597

Email 1: smorrissey@vanguardrenewables.com

Primary Contact: Sarah Morrissey

Email 2:

Additional Engineering Firm Information:

Business Partner ID:

Engineering Firm: Traffic Planning and Design Inc

Phone: (610) 326-3100

Email 1: dmatour@trafficpd.com

Primary Contact: Dan Matour

Email 2: bguthrie@trafficpd.com

Creator Information:

Business Partner ID: 000094

Firm Name: Traffic Planning and Design, Inc.

Phone: 610-326-3100

Email 1: dmatour@trafficpd.com

(1) LOCATION OF PROPOSED DEVELOPMENT:

PennDOT Engineering District: 05

Email:

County: Berks

Email: planning@countyofberks.com

Municipality: CAERNARVON

Email: sanderson@kraftengr.com; jbair@caernarvon.org

NO.	SR	Segment	Offset	Average Daily Trips	Driveway Classification	Local Road
1	0023	0060	0800	70	Low Volume	No

Are there any vehicle weight or size restrictions along the SR in accordance with 75 PA C.S. ss 4902? : No

(2) DESCRIPTION OF PROPOSED DEVELOPMENT (Attach site plan if available):

Proposed site access:
The site will be accessed by a full-access driveway to S.R. 0023, aligned with the existing Twin Valley Fire Department Driveway.

Proposed land uses:
The proposed development will consist of a codigestor (manure and food waste). Based on information provided to TPD, the proposed land use will have approximately 10 employees and may generate up to 50 truck trips per day (25 enter, 25 exit).

Community linkages *(access to neighboring properties, cross easements, pedestrian and transit accommodations):*
The Applicant is proposing to lease a portion of land from Kurtland Farms. The proposed land use will have an independent driveway and will not impact how the current driveways are used for day-to-day farm operations. Since modifications to the driveways may impede the agricultural operations and access to the existing barn, no changes are proposed to the existing agricultural land uses or driveways.

(3) DEVELOPMENT SCHEDULE AND STAGING:

Anticipated Opening Date: 01-01-2024
Full Buildout Date: 01-01-2024

Describe Proposed Development Schedule/Staging:
None

(4) TRIP GENERATION:

Land Use & Size	Land Use Code	Were ITE results used?	Daily Trips	AM Peak Hour		PM Peak Hour		Saturday Peak Hour	
				Enter	Exit	Enter	Exit	Enter	Exit
Manure Digestor (10 employees)	170	No	70	6	1	1	7		
		TOTAL:	70	6	1	1	7	0	0

(5) TRANSPORTATION IMPACT STUDY REQUIRED?

Transportation Impact Study Required? No

If Yes, based on:
During any one-hour time period, 100 or more additional vehicle trips entering or exiting an existing development.

Other considerations as described below:

(6) TRANSPORTATION IMPACT ASSESSMENT REQUIRED?

Transportation Impact Assessment Required? Yes

(7) STUDY AREA:

Roadway and Study Intersections:
Main Street (S.R. 0023) & Conestoga Road (S.R. 0401) Main Street (S.R. 0023) & Existing Twin Valley Fire Department Driveway

Land use context (Refer to PennDOT Design Manual, Part 1X, Appendix B):
Rural

Known Congestion Areas:

None

Known Safety Concerns:
None

Known Environmental Constraints:
None

Pedestrian/Bike Review (Community Centers, Parks, Schools, etc.):
The site is located in a rural area. There are no sidewalks on Main Street (S.R. 0023) or Conestoga Road (S.R. 0401). Twin Valley Elementary Center is located on Conestoga Road, approximately 0.25 miles south of the site.

Transit Review (Current routes/stops):
None

(8) STUDY AREA TYPE:

Study Area Type: Rural

(9) TIS ANALYSIS PERIODS AND TIMES:

Analysis period and times notes:
Weekday AM Peak Hour (between 7-9 AM); PM Peak Hour (between 4-6 PM); Existing 2022 conditions, 2024 no-build conditions, 2024 build conditions

(10) TRAFFIC ADJUSTMENT FACTORS:

(a) Seasonal Adjustment (Identify counts requiring adjustment and methodology):
N/A

(b) Annual Base Traffic Growth: 0.58 %/yr. **Source:** PennDOT BPR

(c) Pass-By Trips (Attach justification where required):

NO.	Land Use	%	Source

(d) Captured Trips for Multi-Use Sites:
N/A

(e) Modal Split Reductions:
N/A

(f) Other Reductions:
N/A

(11) OTHER PROJECTS WITHIN STUDY AREA TO BE ADDED TO BASE TRAFFIC:

Notes:
To be determined based off feedback from the township.

(12) TRIP DISTRIBUTION AND ASSIGNMENT:

Trip Distribution Notes:
The trip distribution assignment will be determined based on existing traffic patterns at the intersection of Main St (SR 0023) & Conestoga Road.

(13) APPROVAL OF DATA COLLECTION ELEMENTS AND METHODOLOGIES:

NO.	Location	Period	Type

1	Main Street (SR 0023) & Conestoga Road	AM Peak, PM Peak	TMC
2	SR 0023 & Twin Valley Fire Dept Driveway	AM Peak, PM Peak	TMC

(14) CAPACITY/LOS ANALYSIS:

NO.	Location	Period	Type
1	Main Street (SR 0023) & Conestoga Road	AM Peak, PM Peak	HCM 6 from Synchro 11
2	SR 0023 & Twin Valley Fire Dept Driveway	AM Peak, PM Peak	HCM 6 from Synchro 11

(15) ROADWAY IMPROVEMENTS/MODIFICATIONS BY OTHERS TO BE INCLUDED:

Roadway Improvements:
None

(16) OTHER NEEDED ANALYSES:

(a) Sight Distance Analysis:
A sight distance analysis will be performed for the proposed site driveway.

(b) Signal Warrant Analysis (Identify locations):
If necessary, a signal warrant analysis will be performed at any intersection where LOS mitigation may be needed.

(c) Required Signal Phasing/Timing Modifications (Determine for all signalized intersections; specify methodology):
N/A

(d) Traffic Signal Corridor/Network Analysis (Identify locations/methodology):
N/A

(e) Analysis of the Need for Turning Lanes (Identify locations/methodology):
Turn lane warrants will be evaluated for the proposed site driveway utilizing the warrant analysis methodology contained within Chapter 11 of PennDOT publication 46.

(f) Turning Lane Lengths (Identify methodology to be used):
If warrants are satisfied, turn lane lengths will be evaluated based on the methodology contained within Chapter 11 of PennDOT publication 46.

(g) Left Turn Signal Phasing Analysis (Identify locations/methodology):
N/A

(h) Queuing Analysis (Identify locations/methodology):
TPD will analyze the 95th percentile queue lengths for al approaches of the study area intersection during all time periods analyzed. This analysis will be completed using the Synchro 11 software, based on HCM 6 methodology.

(i) Gap Studies (Identify locations/methodology):
None

(j) Crash Analysis (Identify locations):
None

(k) Weaving Analysis (Identify locations):
N/A

(l) Other Required Studies (Specify locations/methodology):
N/A

(17) ADDITIONAL COMMENTS OR RECOMMENDATIONS RELATIVE TO THE SCOPE OF THE TIS:

Additional Comments:
Based on information provided to TPD, the proposed codigestor will have approximately 10 employees and may generate up to 25 truck trips per day. TPD reviewed data for LUC 110 (General Light Industrial) and LUC 170 (Utility). LUC 170 includes similar uses such as water supply or sewage treatment and the data set includes several sites with 1 to 20 employees. Therefore, the trip generation calculations are based on LUC 170. The data is generally consistent with the estimates provided to TPD.

PennDOT Review Comments: (Current Cycle Comments)

After review of the scoping meeting application, the Department will contact the applicant regarding the need for a scoping meeting prior to applying for a highway occupancy permit.

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TRAFFIC PLANNING AND DESIGN, INC.
WWW.TRAFFICPD.COM

May 8, 2023

Ray Boretski
PennDOT District 5-0
1002 Hamilton Street
Allentown, PA 18101

RE: Response to Traffic Impact Study Comments – Elverson AD1
Caernarvon Township, Berks County, PA
TPD No. MACK 00010

Dear Ray:

Traffic Planning and Design, Inc. (TPD) has completed its responses to comments provided by PennDOT District 5-0 (dated January 17, 2023) regarding the TIA submission prepared by TPD. The traffic related comments are denoted by **bold** text and our corresponding responses follow.

Please note that, based upon feedback received from Caernarvon Township, the proposed site access has been relocated. The access is now proposed to be aligned with the Twin Valley Fire Department Driveway. The scoping application has been revised accordingly.

1. **Please do not reply all to this review. If you have any questions regarding these comments, your review team is: Melissa Maupin - mmaupin@pa.gov; Ray Boretski - rboretski@pa.gov; Earl Armitage - earmitage@Pennoni.com; Kristen Kostick - kkostick@Pennoni.com.**

   So noted.

2. **Label property owners on the site plan on both sides of SR 23. All frontage under the applicant's ownership (along both sides of SR 23) must be addressed and permitted as part of this project. For instance, the existing driveway to the west must be upgraded to meet driveway standards and shown on the HOP plans to be permitted. Is it unclear whether the applicant also owns the property across SR 23 from the existing driveway. If so, that frontage must be addressed.**

   As requested, the revised plan includes labels for the property owners on both sides of SR 23. The adjacent agricultural land on either side of SR 23 is owned by the same property owner but will remain an agricultural use. The Applicant is proposing to lease a portion of land from Kurtland Farms. The proposed facility will be operated separately from the farm and will not be using the existing farm driveways on either side of Main Street or accessing areas beyond the lease area. The presence of this site will not impact how the current driveways are used for day-to-day farm operations. Since modifications to the driveways may impede the agricultural operations and access to the existing barn, no changes are proposed to the existing agricultural land uses or driveways.

3. **Label driveway widths and radii on the site plan. Verify the design vehicle for the site and confirm the driveway footprint is adequate.**

   As requested, the driveway width and radii are labeled on the revised site plan. A turning template for a WB-62 truck is also shown on the revised plan.

4. **Additional comments regarding access and shoulder upgrading requirements will be provided when the more detailed site plan is provided with the scoping resubmission.**

   So noted.

5. **Indicate on the plan the square footage of any offices related to the proposed codigester, or where the employees will be based.**

   As requested, the size of the proposed truck reception office and organics receiving facility are labeled on the revised plan. The proposed facility is expected to have approximately 10 employees.

6. **Include the existing driveway and SR 23 as a study intersection in the TIA. What cross traffic is expected between the existing uses and the proposed use since it will be interconnected?**

   The proposed facility will be operated separately from the farm and will not be using the existing farm driveways on either side of Main Street or accessing areas beyond the lease area. The interaction points with the farm will be: to the west of the barn, where Vanguard will accept manure from the farm through a pipe (labeled as "tank" on the map); to the northwest of the barn, where the farmer will be given access to a building (#8 "Payloader Area" on the map) where he can pick up animal bedding for transfer to his barn (similar to the current operation); and at the eastern end of the lease area where the farmer can pump liquid from the holding lagoon (#22 "Digestate Storage Lagoon Area") for application to the crops (similar to current operations). Vehicles accessing the Vanguard lease area will only be allowed to use the proposed driveway for both entrance and exiting the site, and the presence of this site will not impact how the current driveways are used for day-to-day farm operations.

7. **A signal warrant analysis is not necessary unless mitigation is needed or intersection operations warrant further study.**

   The scoping application has been revised accordingly.

8. **Verify the estimated driveway trips based on the description. It seems the 10 employees will be on site and the 25 truck trips will be in addition to any employee trips. Each employee will generate at least 2 trips per day (entering and exiting) and possibly more (for instance over lunch break). Also confirm that 25 truck trips are anticipated per day, and not 25 trucks (entering and exiting for a total of 50 trips). Reevaluate the driveway trip estimate and confirm its classification. It seems that given the potential trips and land use, a low volume driveway classification might be more appropriate.**

   The scoping application has been revised to clarify that 50 daily truck trips are projected (25 enter, 25 exit). The trip generation calculations and driveway classification have been revised accordingly.

Thank you for your continuing review, and please call if there is any further information you require with regards to these responses.

Sincerely,

TRAFFIC PLANNING AND DESIGN, INC.

Benjamin T. Guthrie, P.E.
Senior Project Manager

bguthrie@TrafficPD.com

pennsylvania
DEPARTMENT OF TRANSPORTATION

TRANSPORTATION IMPACT STUDY (TIS) DETERMINATION & SCOPING MEETING APPLICATION

Scoping Meeting Application: Submitted

Scoping Meeting Date:

Scoping Number: S0520220128

Tax Parcel Number:

Project/Development Name: Elverson AD1

Applicant Information:

Business Partner ID:

Applicant Name: Vanguard Organics LLC

Phone: (781) 232-7597

Email 1: smorrissey@vanguardrenewables.com

Primary Contact: Sarah Morrissey

Email 2:

Additional Engineering Firm Information:

Business Partner ID:

Engineering Firm: Traffic Planning and Design Inc

Phone: (610) 326-3100

Email 1: dmatour@trafficpd.com

Primary Contact: Dan Matour

Email 2: bguthrie@trafficpd.com

Creator Information:

Business Partner ID: 000094

Firm Name: Traffic Planning and Design, Inc.

Phone: 610-326-3100

Email 1: dmatour@trafficpd.com

(1) LOCATION OF PROPOSED DEVELOPMENT:

PennDOT Engineering District: 05

Email:

County: Berks

Email: planning@countyofberks.com

Municipality: CAERNARVON

Email: sanderson@kraftengr.com; jbair@caernarvon.org

NO.	SR	Segment	Offset	Average Daily Trips	Driveway Classification	Local Road
1	0023	0060	0000	35	Minimum Use	No

Are there any vehicle weight or size restrictions along the SR in accordance with 75 PA C.S. ss 4902? : No

(2) DESCRIPTION OF PROPOSED DEVELOPMENT (Attach site plan if available):

Proposed site access:
The site will be accessed by a full-access driveway aligned with the existing intersection of Main Street (S.R. 0023) & Conestoga Road (S.R. 0401).

Proposed land uses:
The proposed development will consist of a codigestor (manure and food waste). Based on information provided to TPD, the proposed land use will have approximately 10 employees and may generate up to 25 truck trips per day.

Community linkages *(access to neighboring properties, cross easements, pedestrian and transit accommodations):*
The proposed digester is associated with the existing Kurtland Farms dairy farm. There will be internal connections between the two uses. The existing driveway to S.R. 0023, located approximately 500 feet west of Conestoga Road, will remain.

(3) DEVELOPMENT SCHEDULE AND STAGING:

Anticipated Opening Date: 01-01-2024
Full Buildout Date: 01-01-2024

Describe Proposed Development Schedule/Staging:
None

(4) TRIP GENERATION:

Land Use & Size	Land Use Code	Were ITE results used?	Daily Trips	AM Peak Hour		PM Peak Hour		Saturday Peak Hour	
				Enter	Exit	Enter	Exit	Enter	Exit
Manure Digestor (10 employees)	170	Yes	39	6	1	1	7		
		TOTAL:	39	6	1	1	7	0	0

(5) TRANSPORTATION IMPACT STUDY REQUIRED?

Transportation Impact Study Required? No

If Yes, based on:
During any one-hour time period, 100 or more additional vehicle trips entering or exiting an existing development.

Other considerations as described below:

(6) TRANSPORTATION IMPACT ASSESSMENT REQUIRED?

Transportation Impact Assessment Required? Yes

(7) STUDY AREA:

Roadway and Study Intersections:
Main Street (S.R. 0023) & Conestoga Road (S.R. 0401).

Land use context (Refer to PennDOT Design Manual, Part 1X, Appendix B):
Rural

Known Congestion Areas:
None

Known Safety Concerns:

None

Known Environmental Constraints:
None

Pedestrian/Bike Review (Community Centers, Parks, Schools, etc.):
The site is located in a rural area. There are no sidewalks on Main Street (S.R. 0023) or Conestoga Road (S.R. 0401). Twin Valley Elementary Center is located on Conestoga Road, approximately 0.25 miles south of the site.

Transit Review (Current routes/stops):
None

(8) STUDY AREA TYPE:

Study Area Type: Rural

(9) TIS ANALYSIS PERIODS AND TIMES:

Analysis period and times notes:
Weekday AM Peak Hour (between 7-9 AM); PM Peak Hour (between 4-6 PM); Existing 2022 conditions, 2024 no-build conditions, 2024 build conditions

(10) TRAFFIC ADJUSTMENT FACTORS:

(a) Seasonal Adjustment (Identify counts requiring adjustment and methodology):
N/A

(b) Annual Base Traffic Growth: 0.58 %/yr. **Source:** PennDOT BPR

(c) Pass-By Trips (Attach justification where required):

NO.	Land Use	%	Source

(d) Captured Trips for Multi-Use Sites:
N/A

(e) Modal Split Reductions:
N/A

(f) Other Reductions:
N/A

(11) OTHER PROJECTS WITHIN STUDY AREA TO BE ADDED TO BASE TRAFFIC:

Notes:
To be determined based off feedback from the township.

(12) TRIP DISTRIBUTION AND ASSIGNMENT:

Trip Distribution Notes:
The trip distribution assignment will be determined based on existing traffic patterns at the intersection of Main St (SR 0023) & Conestoga Rd and the existing Kurtland Farms driveway.

(13) APPROVAL OF DATA COLLECTION ELEMENTS AND METHODOLOGIES:

NO.	Location	Period	Type
1	Main Street (SR 0023) & Conestoga Road	AM Peak, PM Peak	TMC
2	Main Street (SR 0023) & Kurtland Farms Driveway	AM Peak, PM Peak	TMC

(14) CAPACITY/LOS ANALYSIS:

NO.	Location	Period	Type
1	Main Street (SR 0023) & Conestoga Road	AM Peak, PM Peak	HCM 6 from Synchro 11

(15) ROADWAY IMPROVEMENTS/MODIFICATIONS BY OTHERS TO BE INCLUDED:

Roadway Improvements:
None

(16) OTHER NEEDED ANALYSES:

(a) Sight Distance Analysis:
A sight distance analysis will be performed for the intersection of Main Street (S.R. 0023) & Conestoga Road (S.R. 0401)

(b) Signal Warrant Analysis (Identify locations):
A signal warrant analysis will be performed at the intersection of Main Street (S.R. 0023) & Conestoga Road (S.R. 0401)

(c) Required Signal Phasing/Timing Modifications (Determine for all signalized intersections; specify methodology):
N/A

(d) Traffic Signal Corridor/Network Analysis (Identify locations/methodology):
N/A

(e) Analysis of the Need for Turning Lanes (Identify locations/methodology):
Turn lane warrants will be evaluated for the proposed site driveway location at the intersection of Main Street (S.R. 0023) & Conestoga Road (S.R. 0401) utilizing the warrant analysis methodology contained within Chapter 11 of PennDOT publication 46.

(f) Turning Lane Lengths (Identify methodology to be used):
If warrants are satisfied, turn lane lengths will be evaluated based on the methodology contained within Chapter 11 of PennDOT publication 46.

(g) Left Turn Signal Phasing Analysis (Identify locations/methodology):
If signal warrants are satisfied, signal phasing will be evaluated at the intersection of Main Street (S.R. 0023) & Conestoga Road (S.R. 0401).

(h) Queuing Analysis (Identify locations/methodology):
TPD will analyze the 95th percentile queue lengths for al approaches of the study area intersection during all time periods analyzed. This analysis will be completed using the Synchro 11 software, based on HCM 6 methodology.

(i) Gap Studies (Identify locations/methodology):
None

(j) Crash Analysis (Identify locations):
None

(k) Weaving Analysis (Identify locations):
N/A

(l) Other Required Studies (Specify locations/methodology):
N/A

(17) ADDITIONAL COMMENTS OR RECOMMENDATIONS RELATIVE TO THE SCOPE OF THE TIS:

Additional Comments:

Based on information provided to TPD, the proposed codigestor will have approximately 10 employees and may generate up to 25 truck trips per day. TPD reviewed data for LUC 110 (General Light Industrial) and LUC 170 (Utility). LUC 170 includes similar uses such as water supply or sewage treatment and the data set includes several sites with 1 to 20 employees. Therefore, the trip generation calculations are based on LUC 170. The data is generally consistent with the estimates provided to TPD.

PennDOT Review Comments: (Current Cycle Comments)

After review of the scoping meeting application, the Department will contact the applicant regarding the need for a scoping meeting prior to applying for a highway occupancy permit.

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APPENDIX B:

Study Area Photographs

Job #: MACK.00010 *Date Taken:* 4/4/2024 *Intersection Of:* Conestoga Rd (SR 0401) & Main Street (SR 0023)

Direction / Road: **Nb. Conestoga Rd (SR 0401)**
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: **Nb. Conestoga Road (SR 0401)**
Approach / Departure: Approach
Distance: 200 Feet

Job #: MACK.00010 *Date Taken:* 4/4/2024 *Intersection Of:* Conestoga Rd (SR 0401) & Main Street (SR 0023)

Direction / Road: **Eb. Main Street (SR 0023)**
Approach / Departure: Approach
Distance: 50 feet

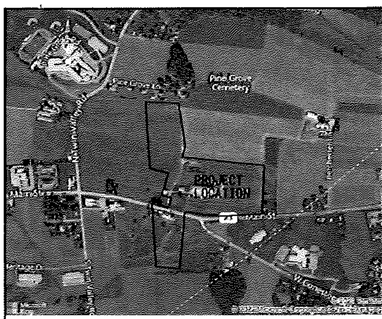
Direction / Road: **Eb. Main Street (SR 0023)**
Approach / Departure: Approach
Distance: 200 Feet

Job #: *MACK.00010* *Date Taken:* *4/4/2024* *Intersection Of:* *Conestoga Rd (SR 0401) & Main Street (SR 0023)*

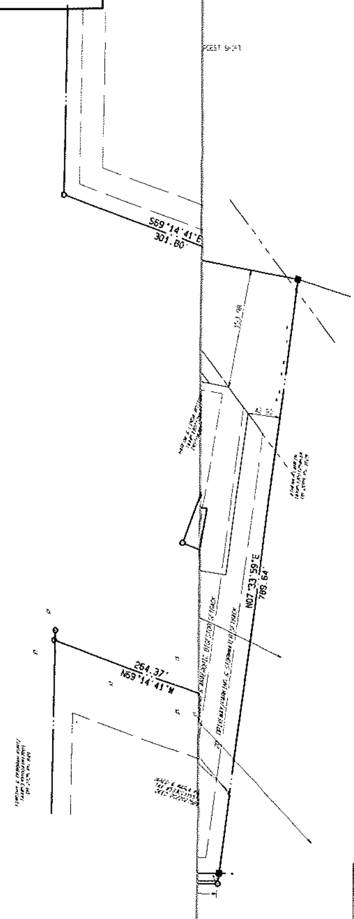
Direction / Road: **Wb. Main Street (SR 0023)**
Approach / Departure: Approach
Distance: 50 feet

Direction / Road: **Wb. Main Street (SR 0023)**
Approach / Departure: Approach
Distance: 200 Feet

Exhibit D



LOCATION MAP



STRUCTURES

1A - DIGESTER - A	90 DIA
1B - DIGESTER - B	90 DIA
2 - HYDROLYSIS TANK - 1	20 DIA
3 - HYDROLYSIS TANK - 3	20 DIA
4 - PROCESS WATER TANK	20 DIA
5 - HYDROLYSIS TANK -2	50 DIA
6 - FERRIC CHLORIDE TANK	12 DIA
7 - BOILER	20 x6'
8A - HEAT EXCHANGER - A	40 x8
8B - HEAT EXCHANGER - B	40 x8
9A - LIQUID OFFLOAD AREA - A	60 x30
9B - LIQUID OFFLOAD AREA - B	60 x30
9C - LIQUID OFFLOAD AREA - C	60 x30
10 - BIOGAS UPGRADING PLANT	91 x91
11 - MSR STATION	150' x150
12 - ELECTRICAL BUILDING	36 -3' x22 -6'
13-A - TRANFORMER - A	10 x12'
13-B - TRANFORMER - B	10 x12
14 - -GENERATOR	8' x7
15 - CAR PARKING AREA	20 x9
16-A - UTILITY CONTAINER - A	40 x8
16-B - UTILITY CONTAINER - B	40 x8
17 - OPERATOR CONTAINER	40 x8
18 - MANURE PIT	16 x14 x12' DEEP
19 - SEPTIC TANK	10 x10
20 - FLARE	
21 - OPERATOR TRAILER PAD	60' x40
22 - SOLID SEPARATION BUILDING	54 -6' x27 -0'
23 - PRESSATE HOLDING TANK	10 DIA
24 - PUMP CONTAINER - 1	40 x8
25 - PUMP CONTAINER - 2	40 x8
26 - PUMP CONTAINER - 3	40 x8
27 - PUMP CONTAINER - 4	40 x8
28 - LAGOON AREA	631 x151
29 - FIRE WATER TANK	22 DIA

ZONING
EFFECTIVE AGRICULTURAL
PRESERVATION DISTRICT (EAP)

	REQUIRED	EXISTING	PROPOSED
MIN. LOT AREA	40 ACRES	53.03 ACRES (NET) 54.035 ACRES (GROSS)	53.03 ACRES (NET) 54.035 ACRES (GROSS)
MIN. LOT WIDTH @ STREET LINE	150'	1539'	1539'
MIN. LOT WIDTH @ BUILDING SETBACK LINE	150'	1526'	1526'
FRONT YARD	50'	313.37'	313.37'
SIDE YARD	50'/50'	40.43'/784.05'	40.43'/365.92'
REAR YARD	50'	433.69'	63.27'
MAX. LOT COVERAGE	25%	5.48%	12.33%
MAX. PAVED AREA	15%	0.25%	4.52%
MAX. BLDG HEIGTH (EXCEPT BARNS, SILO & GRAIN ELEVATORS)	35'	-	-

PA ONE CALL
SERIAL #20231242229
DATE: 05/09/2023

MACK Engineering Inc.
CIVIL ENGINEERING
MUNICIPAL ENGINEERING
LAND PLANNERS
429 BARBARA STREET
LANDISVILLE, PA 17538
P: 717-898-8449
E: mmack@mackengineering.net
www.mackengineering.net

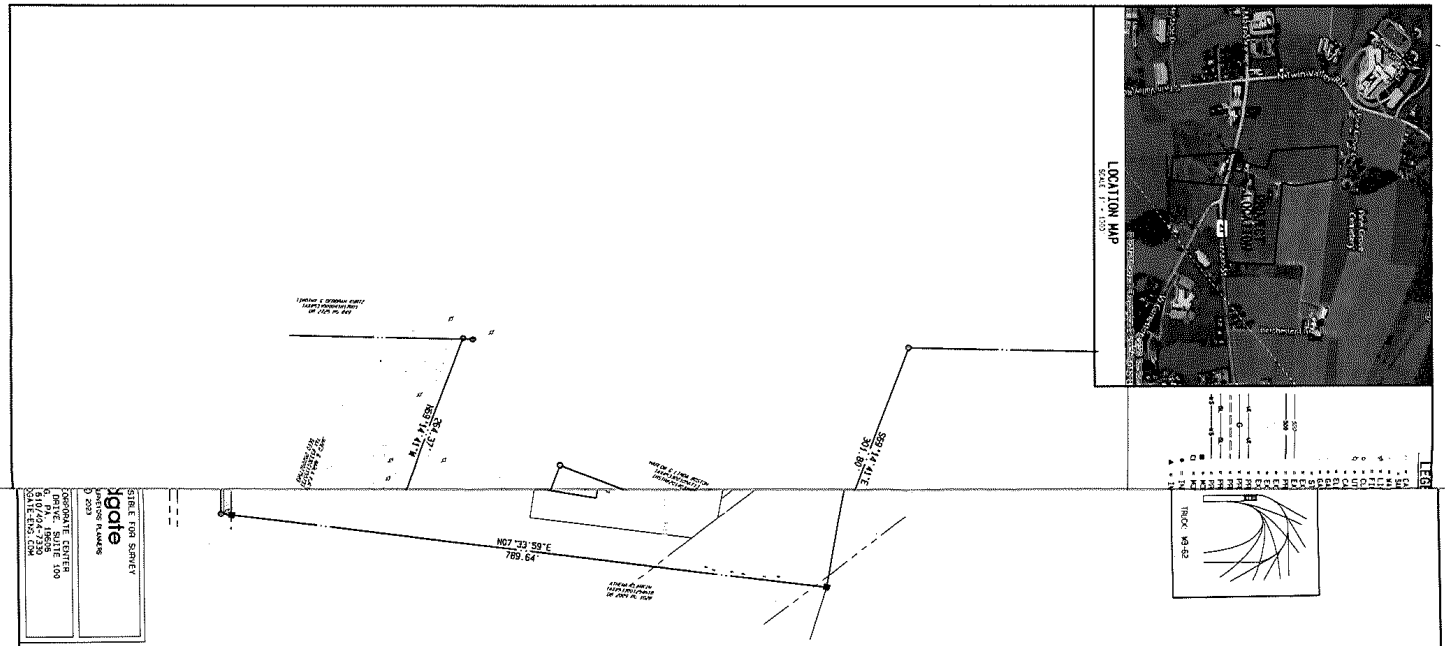
LAND DEVELOPMENT PLAN

PRELIMINARY/FINAL PLAN
ELVERSON AD 1

SITE ADDRESS:
4366 MAIN STREET
ELVERSON
PA 19520

TOWNSHIP:
CAERNARVON
COUNTY:
BERKS

COMPUTER FILE: Kurtland Dairy.PRO
JOB# BRK-CNV-22-01
CHECKED BY: MJM
DRAWN BY: SPE
DATE: 09/15/2024
SCALE 1"=80
SHEET NO
SHEET C102



SITE FOR SURVEY

CORPORATE CENTER
DRIVE, SUITE 100
610/404-7330
SKATE-ENG.COM

PA ONE CALL

SERIAL #20231242229
DATE: 05/09/2023

SEAL

COMPUTER FILE: Kurtland Dairy.PRO
JOB# BRK-DW-22-01
CHECKED BY: MJM
DRAWN BY: SPE
DATE: 08/15/2024
SCALE 1"=80'
SHEET NO.
SHEET

REVISION	DATE	DESCRIPTION

SITE ADDRESS:
4366 MAIN STREET
ELVERSON
PA 19520

TOWNSHIP:
CAERNARVON

COUNTY:
BERKS

TRUCK TURNING TEMPLATE PLAN

PRELIMINARY/FINAL PLAN
ELVERSON AD 1

MACK
Engineering Inc.
CIVIL ENGINEERING
MUNICIPAL ENGINEERING
LAND PLANNERS
429 BARBARA STREET
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p: 717-990-8449
e: mmack@mackengineering.net
www.mackengineering.net

Exhibit E

Detailed Description of Proposed Use

Agricultural preservation is key to Vanguard Renewables' vision to transform organic waste into a force for good – decarbonizing our world and supporting regenerative agriculture. Since 2003, the United States has lost more than half of its licensed dairy operations, approximately 32,000 dairies. Dairy farmers are facing the pressures of rising inflation, feed costs, urban encroachment and volatile milk market prices. Vanguard Renewables cultivates a collaborative partnership with host farmers, providing them opportunity to diversify their revenue streams and adapt with technological innovations. While mitigating emissions, anaerobic digestion provides a common technological on-farm odor mitigation and manure management solution. Methane capture reduces on-farm emissions while also providing farmers with beneficial products in the form of animal bedding and liquid fertilizer. The liquid digestate can be applied to cropland as a nutrient rich soil amendment as directed by the farm's nutrient management plan. Host farmers can significantly reduce synthetic fertilizer consumption upon switching to this liquid digestate.

The proposed facility will receive organic food waste materials and anaerobically digest them (break down in the absence of oxygen) with manure to produce biogas, which will be collected and upgraded on-site to pipeline quality natural gas (Renewable Natural Gas; RNG). In addition to RNG, the digestion process will produce two byproducts that are suitable for beneficial use. These byproducts are a solid fibrous material and a water-based liquid digestate (pressate). The anaerobic digestor site is designed with a series of specialized areas and equipment to efficiently handle manure and food waste.

Food waste will arrive on site via liquid tanker trucks. Trucks will pull onto the unloading pads and connect via hose to liquid unloading ports, which will pump the food waste into one of three fully enclosed hydrolysis processing tanks. In these tanks the food waste will be heated and mixed, beginning to breakdown and homogenize. The hydrolysis tanks will be equipped with either a carbon or biofilter as a means of odor control (Exhibit I). The hydrolysis tanks are continuously dosing the homogenized mixture into the anaerobic digesters 24/7 with a retention time of 3-5 days.

Food waste sources consist of expired and off-spec food and beverage washwater and residuals from food and beverage manufacturing and preparation, restaurants, commercial food and beverage producers, and institutions. This includes but is not limited to dairy wastes such as milk, milk products, buttermilk whey, ice cream, yogurt, and cheese; oils from meat fats in cooking and food scraps, cooking oil, shortening, fryolator oil and grease, lard, butter, margarine, gravy, mayonnaise, salad dressings, sour creams and other foods high in fat; glycerin produced from used cooking oil through biodiesel production; brewery wastes including spent grains, brewery trub, and residual brewer process water; and slurried food waste from grocery stores, distributors, etc.

The facility will utilize Kurtland Farms' existing manure pit, from which manure will be dosed into the two anaerobic digesters and mix with the food waste material. The mixed slurry is broken down within the anaerobic digester vessel over the course of 30 days via a microbial process in the absence of oxygen, converting some of the material to biogas. The digesters are continuously fed by both the hydrolysis tanks and the manure pit on site and continuously mixed. Following the 30 day digestion period, the processed slurry exits the digester as "digestate". Digestate is routed

to the screw-press to remove the fibrous solid material, which is repurposed as bedding for dairy cattle. The liquid digestate is routed to the digestate lagoon, until it is land applied as agricultural fertilizer. The digestate lagoons provide a minimum of 6 months of storage for the liquid pressate, and Kurtland Farms' existing solids separaton building will be used to provide a minimum of 3 days of storage for the animal bedding.

The biogas produced in the anaerobic digesters is upgraded through a series of cooling and purification stages to produce RNG. The facility integrates advanced screening, separation, and biogas upgrading technologies to optimize recycling, energy recovery, and regulatory compliance.

Elverson AD 1 will operate within a clearly defined and self-contained project lease area at Kurtland Farms located in Elverson, PA (Exhibit "D"). The Property is bisected by Main Street, otherwise known as Route 23. The Property is located in the Effective Agricultural Preservation zoning district. Operators will control and monitor who enters or leaves its project area. Elverson AD 1 will ensure that any and all traffic associated with the project will respect the community rules and guidelines.

Elverson AD 1's operators will be highly trained staff working on site to maintain and operate the projects. An onsite team of 3-6 operators will maintain digester operations. Daily maintenance is conducted per vendor specifications for each piece of equipment. The site's operational support team includes biology engineers, environmental engineers, logistics teams, and operations managers who work closely with on-site operators to address any issues promptly, and in the best possible way. Our highly experienced and skilled operations team differentiates Vanguard Renewables from other biogas industry competitors.

Exhibit F

BERKS COUNTY CONSERVATION DISTRICT

Since 1946

September 11, 2024

Jeff Ainslee
Scotch Hill Solutions
352 Harvest Drive
Lititz, PA 17543

Dear Jeff,

In response to your request of 8/21/24, I am writing to inform you that the Berks County Conservation District (BCCD) received a Nutrient Management Plan (NMP) for Kurtland Farms on 3/30/2024 from Scotch Hill Solutions. The NMP was subsequently reviewed for accuracy and completeness and has been determined to meet the Manure Management requirements of the Clean Streams Law of PA.

Kurtland Farms has been a responsible and enterprising cooperator with the Berks County Conservation District for many years and we look forward to cooperating with them for many years to come. We are currently engaged with Kurtland Farms and providing cost-share assistance with a barnyard project at their farm in Elverson, PA. Furthermore, we have also completed a USDA/NRCS conservation plan for that project.

In reference to the Anaerobic Digester Project, we are aware of the project, the farm is a well known cooperative farmer that we have been engaged with on many things in the past, and we anticipate reviewing appropriate aspects of the project such as the NPDES and NMP in which the District is involved. We will defer other approvals to the appropriate parties such as WQM Part II to DEP, etc and are looking forward to working with all parties to reach final approvals as needed to construct the digester.

Sincerely,

Jeff Overstreet

Jeff Overstreet, Agricultural Resources Conservationist

1238 County Welfare Road, Suite 200 • Leesport, PA 19533 • Tel 610-372-4657 • www.berkscd.com

Exhibit G

Operations & Maintenance Plan

I. General Operations

A. Development of System Operating Plans

Operating plans will be developed, maintained, and periodically reviewed/updated in line with Operator's continuous improvement philosophy.

B. AD - Biology: Sample Collection

A continuous loop of sample collection, analysis and feedback is vital to good health, and therefore optimal performance, of anaerobic digestion. Samples will be collected, labelled, and shipped to third party laboratories for testing monthly.

Examples of tasks to be carried out as follows:

- Collection of samples from digester (and from other process points as and when required).
- Lab equipment will be provided for operators to run the necessary analyses for the basic Key Performance Indicators ("KPIs") of digester health.
- Samples are collected daily from each digester to evaluate the KPIs of digester health.
- The resulting KPIs are uploaded into software for ease of tracking, analysis, and comparison by Operator's biology team.
- The patterns and trends of these KPIs will drive the daily decision-making process, revolving primarily on digester health.

C. Daily System Supervision

Up to six operators/technicians will periodically review and at times alter system operating conditions to achieve and maintain the optimal condition of the digester and its supporting infrastructure. Samples of upstream, digester, and downstream process medium will be collected based on the requirements of the Biology Team. Lab analysis shipments will be prepared and shipped. The site will be maintained to a high standard to comply with the dairy farm and operating permits. Examples of tasks to be carried out include:

- Feedstock monitoring - The Facility personnel will control the type and delivery of materials to achieve optimized digestion
- Periodic "walk-downs" by site operators - An inspection of all major components at each Facility. Abnormalities of any components or equipment will be documented in asset management and maintenance software and reported to the appropriate operations personnel.

- Data collection – Raw data for tracking KPI's and maintenance requirements for each major system or component will be collected and documented in asset management and maintenance software.
- Remote Access – Operators will be provided with remote access to the SCADA/HMI program for monitoring the Facility outside of regular operating hours.
- Alarms –Operators will receive alarm notifications directly to their cellular phones for a prompt response to warnings or system failures that have occurred at the Facility.
- On-call duties – An operator will always be on-call for each Facility to respond to alarms outside of regular operating hours.
- Daily check-ins – A daily operations check-in will be conducted via a conference call with all appropriate operations personnel to maintain transparency and cohesion between direct and indirect operations personnel.

D. Site Access and Security

- Site access is controlled by a fence surrounding the entire property with a sliding and locking gate at the site entrance. Traffic is routed to the truck offloading pads with appropriate signs. Site access and yard will be maintained year-round by facility staff.
- Operating hours will be posted at the site entrance. This entrance is closed and locked during non-operating hours, or at any other time that the site operations building is not staffed. The digester systems can be monitored remotely by operators which will send an alert in the event of potential tampering. In the event of an emergency or a need for emergency responders to access the site, the gate can also be unlocked remotely by employees monitoring the facility.

E. 24/7 Emergency On-Call Support

Operator will offer 24/7 on-call support should an issue at site arise which cannot be automatically resolved with the SCADA system. SCADA system will be remotely accessible by site operators. Examples of tasks to be carried out are:

- Review of system automatic operation.
- Review of any alarms and actions to be taken remotely.
- If issues cannot be resolved remotely, Operator shall travel to the site to resolve or implement a safe standby protocol until the following morning.

II. Maintenance

A. Development of Planned Maintenance Program

A scheduled Planned Maintenance program for all qualifying system equipment will be prepared and implemented at the Facility to maximize operating time of the system between planned shut-downs. Operator will follow

the planned maintenance programs of all major equipment suppliers, as well as industry standards and best practices. Examples of tasks to be carried out are:

- Preventative maintenance plan will be developed to schedule routine maintenance and arrange for subcontractors to attend site as required.
- Planned Maintenance shall include tank clean-outs or other Major Maintenance activities to the extent specified in the applicable Purchase Order.

B. Implementation of Planned Maintenance

Operator will endeavor to complete with its own staff as much of the system Planned Maintenance as possible, as allowed by the manufacturers of major plant equipment. There will be a need to enlist the support of third-party Subcontractors and Original Equipment Manufacturers (OEM) as required. Examples of tasks to be carried out are:

- Technicians will carry out the preventative Planned Maintenance for all site equipment which does not require input from a third party (e.g. special lifting, or specialist technician).
- Detailed example task list to be specified in each Purchase Order.

C. Coordination and oversight of subcontractors (third party subcontractors)

Operator will manage Subcontractors during Subcontractor visits to the Facility so that risk to the Facility is minimized. It is likely that multiple Subcontractors will be on site on occasion, and at times they will require special equipment (such as lifting equipment, confined space equipment etc.). The scheduling and management of this will be overseen by the Operator's team.

Examples of tasks to be carried out as follows:

- Set up and execute Long Term Service Agreements with major equipment OEM's to carry out routine maintenance to equipment.
- Scheduling, coordination, and oversight of subcontractor work scope.

D. Equipment

Equipment used for digester operations will be adequate for daily operations and will be inspected to be in proper working condition. The equipment list will vary and may change at any time depending upon available technology and the requirements of the site. All equipment will be maintained on a routine basis. Equipment maintenance records will be kept on-site at the facility.

E. Major Maintenance Procedures, Planning and Tracking

Asset management software will be implemented at the Facility to plan maintenance in compliance with the OEM's requirements and industry standards.

Operator can provide and maintain the software to maximize adherence to schedules and flagging of service requirements.

- All Planned Maintenance will be conducted in accordance with manufacturer's recommendations, unless otherwise indicated through equipment or system performance and their respective KPI's.
- A preventive Planned Maintenance schedule for each Facility will be maintained on a daily, weekly, monthly, quarterly, bi-annual, and annual basis.
- Maintenance software will be available for scheduling, documenting, and tracking each asset and each asset's respective maintenance.
- Maintenance software will provide tracking of operator compliance to the Planned Maintenance schedule.
- Maintenance software will also allow for the documenting and tracking of Planned Maintenance activities preceding regular Planned Maintenance intervals, with the ability to grow, expand and improve as Operator refines its process and as Major Maintenance is authorized or required in an emergency.

III. Procurement

A. Supplier Management

Operator will manage third party suppliers to maximize timely supply and competitively priced procurement of purchased items or services required by the site.

B. Materials Planning & Purchase Strategy

Operator's supply chain team will monitor costs, schedules, and quantities of all supplied materials and services to maximize leveraging of purchase power wherever possible across all sites.

C. Inventory Management – Spare Parts and Consumables

The Operator's supply chain team will set minimum stock levels and will work in partnership with all vendors to maintain those levels to minimize plant downtime due to lack of the relevant parts. Standardization of digester designs will allow us to optimize quantities to minimize stocking costs.

IV. Monitoring, Reporting and Evaluation

A. Review of Sample Data

Operator's biology team will review sample data to maintain optimal performance within the digester.

B. Monitoring of KPI's

Operator's biology team will set KPI's and will closely track the characteristics of the samples against those KPI's. Close and continual monitoring allows the team to react quickly to upset conditions as well as review historic data to identify seasonal trends, changes in feedstock conditions etc.

C. Data Analysis and Biological Health Reporting

As Operator monitors against established KPI's, the biology team will share reports with relevant parties which will allow interested parties the ability to follow the health of the digesters remotely.

D. Corrective Action Plans

If an upset condition occurs (whether it be related to biology of the digester, equipment or other), Operator will issue a corrective action plan to remedy the condition and will liaise with relevant parties until a resolution is achieved.

V. Health, Safety & Environmental

A. Site Specific Safety Program Development

Safety programs will be reviewed with multiple levels of the operating team on a regular basis. Job Safety Analyses ("JSAs") will be implemented and will be reviewed with all personnel entering the Facilities.

B. Periodic Safety Audits

Each Revised Safety Plan incorporating Site-Specific Safety Requirements will call for periodic safety audits to provide for frequent review of the safety of the Sites and Facility and to make authorized improvements wherever and whenever possible.

C. On-Call Support

All Operator employees are trained in site safety; however, an on-call safety supervisor will be available at all times to maximize the safety of all stakeholders.

Telephones will be available at the service building and at the office. Individual onsite contacts will be determined prior to operation.

D. Mobile Equipment Operation

Mobile equipment operators will be trained in safe and proper operation of the mobile equipment. Vehicles will be equipped with backup alarms or warning devices to alert workers when vehicles are backing up. Idling will be minimized indoors, and indoor receiving areas will be well-ventilated to prevent worker exposure to vehicle tailpipe exhaust.

E. Ongoing HSE Training

Operator operates with a heavy bias toward safety. From time to time our corporate safety representatives will provide on- site training modules and require that all employees take safety refresher courses to maintain knowledge of industry best practices.

F. Spill Prevention Control and Countermeasure Plan (SPCC)

A spill prevention control and countermeasure plan (SPCC) will be created for the facility, which will include detail on the necessary manpower, equipment and materials required to expeditiously control and remove material discharged at the Facility. All unloading activities will be monitored to ensure any accidental release is promptly cleaned up.

Spill kits will be present in areas where food waste will be unloaded, and employees will be trained to properly use the spill kits. The SPCC plan will also detail reporting requirements for spills/releases, and emergency contact information. Employees will contact local emergency response agencies if needed to contain the release. Any truck loading and unloading will be supervised by trained personnel.

G. Fire Safety

The Facility will be equipped with a fire suppression sprinkler system, and fire extinguishers will be placed throughout the Facility as required. Personnel will be trained on the proper operation of these fire suppression systems. The high moisture content of the handled food waste material will also limit fires within the Facility.

The facility operates an emergency flare to combust any biogas that would not be able to be sent through the upgrader or if off spec gas is produced. This ensures that all flammable gases produced at the site are not accumulated and are effectively dealt with.

Explosions are not likely due to the high moisture content of the food waste material. Any liquids that result from extinguishing a fire are to be contained onsite using soil berms or other containment measures. All liquids that are collected during emergency actions will be tested and treated, if necessary, prior to discharge.

LEL monitors will be located in enclosed spaces to allow employees to assess potential buildup of methane. As previously noted an emergency flare will be connected to the RNG processing equipment to allow for methane to be burned, as well as acting as a pressure relief device for the RNG process. Various safety alarms and shutdowns will be implemented with both manual and automatic controls. Digesters will also have a pressure release valve in the event

that the biogas cannot be transmitted to the emergency flare. Additionally, all operators will be required to wear fire retardant clothing while onsite and implement best practices to avoid causing sparks or flames.

H. Moving Parts Hazards

Proper safeguards will be implemented for equipment to prevent worker exposure to these hazards. Workers will also be required to wear appropriate PPE, including gloves and safety glasses.

I. Machine Startup Hazards

When process equipment is undergoing maintenance, lockout/tagout practices and procedures will be utilized to prevent unexpected machine startup.

J. Noise Hazards

In processing areas, workers will be required to wear appropriate hearing protection. Noise control is handled on-site by limiting hours of operation and by providing acceptable muffler systems on the vehicle traffic. Engines and equipment, such as the backup generator, meet federal standards for noise control.

K. Safety Reporting

Operator safety personnel will develop, implement, and monitor Facility-specific Safety Plans and Environmental Plans including reporting, in a format agreed by both parties.

L. Odor Control

Odor Control systems will be implemented to ensure odors are contained within the digester system. The hydrolysis tanks will be connected to odor control systems to eliminate ammonia, volatile organic compounds (VOC) and hydrogen sulfide emissions. Forced air ventilation and filtration systems will remove gaseous emissions from the gas stream.

M. Chemical Storage

Chemicals such as Ferric Chloride (FeCl) may be utilized on site to reduce H2S concentrations within the digester tank prior to gas upgrading. IBC totes of FeCl will be held within secondary containment berms to avoid spills.

N. Biogas Upgrading

Raw biogas produced from the anaerobic digester will enter the biogas upgrading system. Volatile organic carbons will be removed first via active carbon followed by hydrogen sulfide via active carbon. The filtered biogas will then be cooled and upgraded to pipeline quality prior to being injected to the grid. Off-spec biomethane will be diverted throughout the upgrading process to be flared. Condensation will be generated during the biogas upgrading process and

collected in a condensation pit (condensate). The condensate will then be delivered into the storage lagoon.

VI. Administration

A. Permitting and Compliance Support

Operator shall obtain all Permits necessary to operate the Facility in accordance with all Laws and Codes and will be responsible for maintaining all such Permits.

B. Dairy Farm Communications Support

Operator will support general relationship management as well as the day-to-day communications with the dairy regarding the delivery of manure, return of recycled materials and other operational interactions with the dairy.

Exhibit H

Odor Mitigation Plan

Odor Control Technology

The odor control system will be used to control odor emissions from air displaced from the headspace of the hydrolysis tanks when receiving the transported organic food waste. As the tank volume level fluctuates, the headspace air will be displaced within the tanks. The headspace of the storage tanks will be connected to either an activated carbon scrubbing filter or biofilter system for odor control treatment.

If an activated carbon system, the equipment is set up in a lead / lag configuration with two separate carbon cells. When the lead carbon cell is spent, the second (lag) carbon cell is available for treatment. This system will be configured to allow the isolation of the lead carbon cell, while the second (lag) carbon is available for treating the air. The spent media in the lead cells can be removed and fresh media can be quickly installed and brought back online. A mist eliminator will be provided upstream of the carbon system to remove particulate, oily/sticky airborne material, and any excessive water vapor. While these materials can easily be removed in a carbon tower directly, a mist eliminator will increase the carbon bed life and prevent clogging which could lead to premature breakthrough, ensuring project equipment is performing optimally for longer.

If a Biofilter system is installed, a heavy-duty blower rerouted to the biofilter will be used to create negative air pressure in the headspace of the tanks. The air will be dispersed throughout the biofilter using an air-distribution grid made of perforated piping. The biofilter will be filled with an appropriate bed and is designed for a minimum empty bed contact time of 10 seconds, sufficient for adequate removal of odors.

The digestion of the manure and food waste occurs in enclosed, sealed, anaerobic digester vessels in order to capture the biogas. The biogas is then conditioned to remove moisture and hydrogen sulfide content using chillers and H2S scrubbers and sent to the biogas upgrader. All of these are enclosed and do not emit odors. During project commissioning or during utility downtime, biogas will be stored in the headspace of the digester or sent to the emergency enclosed biogas flares where the biogas will be combusted before being released to atmosphere. Combusted biogas is odorless.

Post digestion the residual digested material (digestate) is pumped to a screw press to remove fibrous material that the farm can utilize as animal bedding. The bedding will be stored in the farm's existing bedding building. The solid digestate will contain very little odor-causing organic matter, and much less than solids separated from raw manure, which will reduce the potential for odors during drying and storage prior to utilization in the barns.

The liquid digestate from the screw press will be pumped to an onsite storage lagoon. The lagoon contents will be used to irrigate and fertilize fields at the site and neighboring farms. Similar to the solid digestate, the liquid digestate will contain very little odor causing organic matter, as gas produced during breakdown of the organic material has been captured in the headspace of the anaerobic digester and piped into the biogas upgrader. Because of this, there will be a much reduced odor from the land spreading of digestate on fields for fertilizer compared to manure spreading.

Daily inspections by the operations team and continuous preventative maintenance on site will ensure that the odor control technology continues to adequately treat all head space air in the hydrolysis tanks and that the facility is able to control odors and mitigate impact on adjacent property owners.

Exhibit I

VANGUARD RENEWABLES

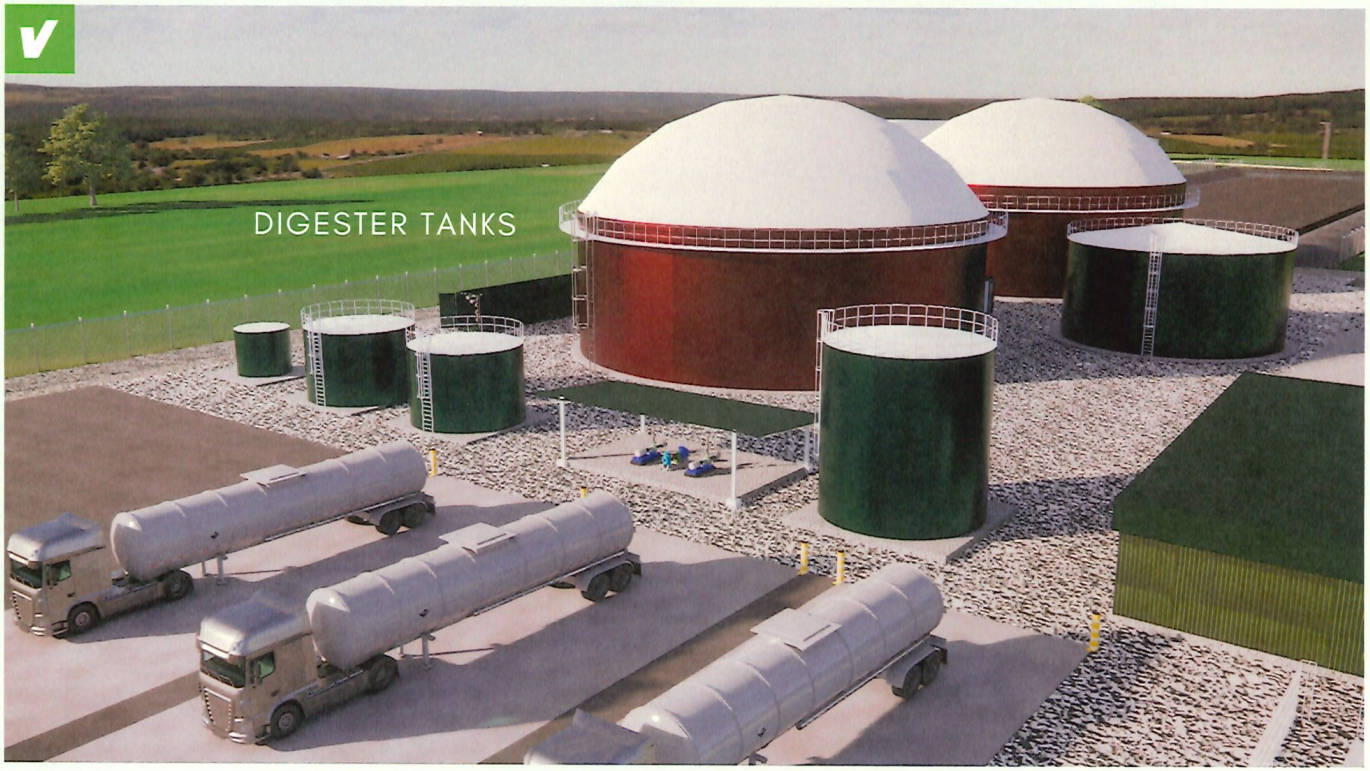
VANGUARD RENEWABLES

ELVERSON AD 1

3D RENDERS

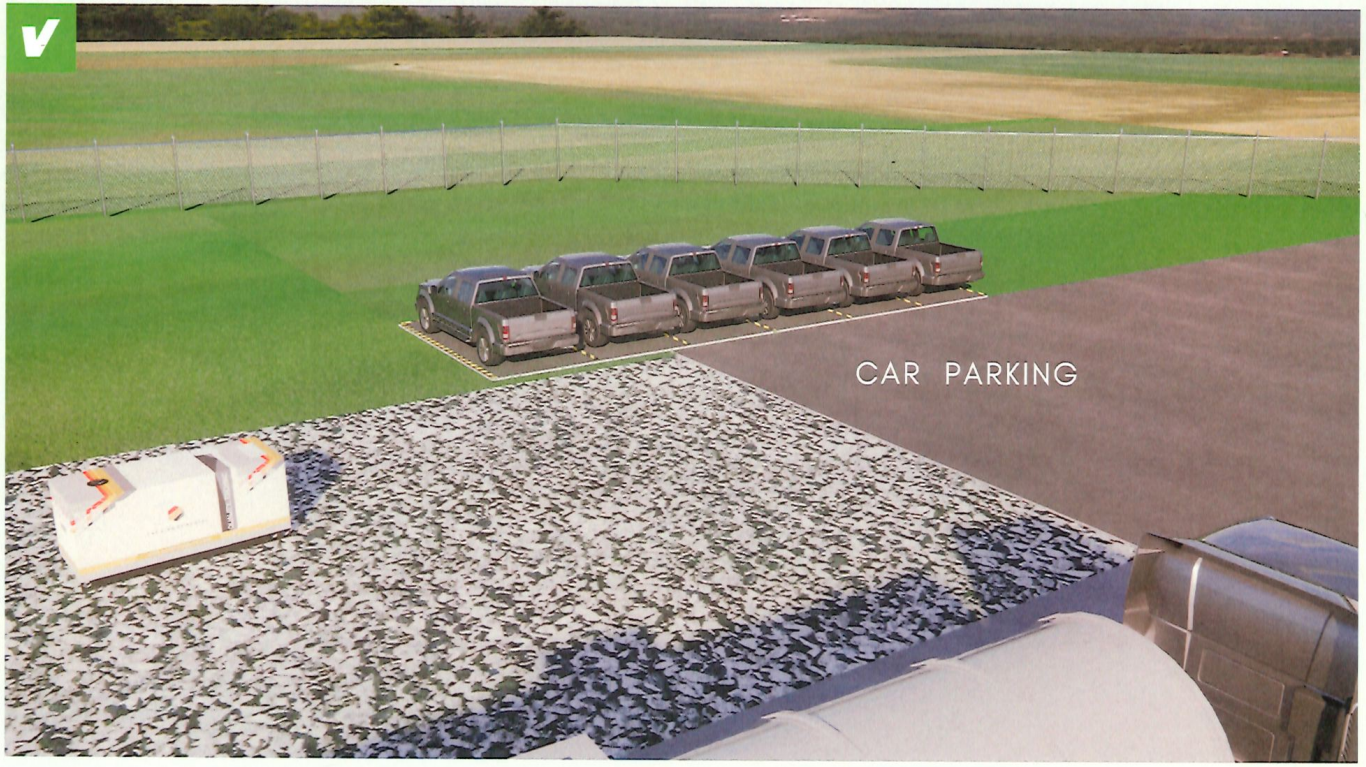

PLAN VIEW


UTILITY BUILDING

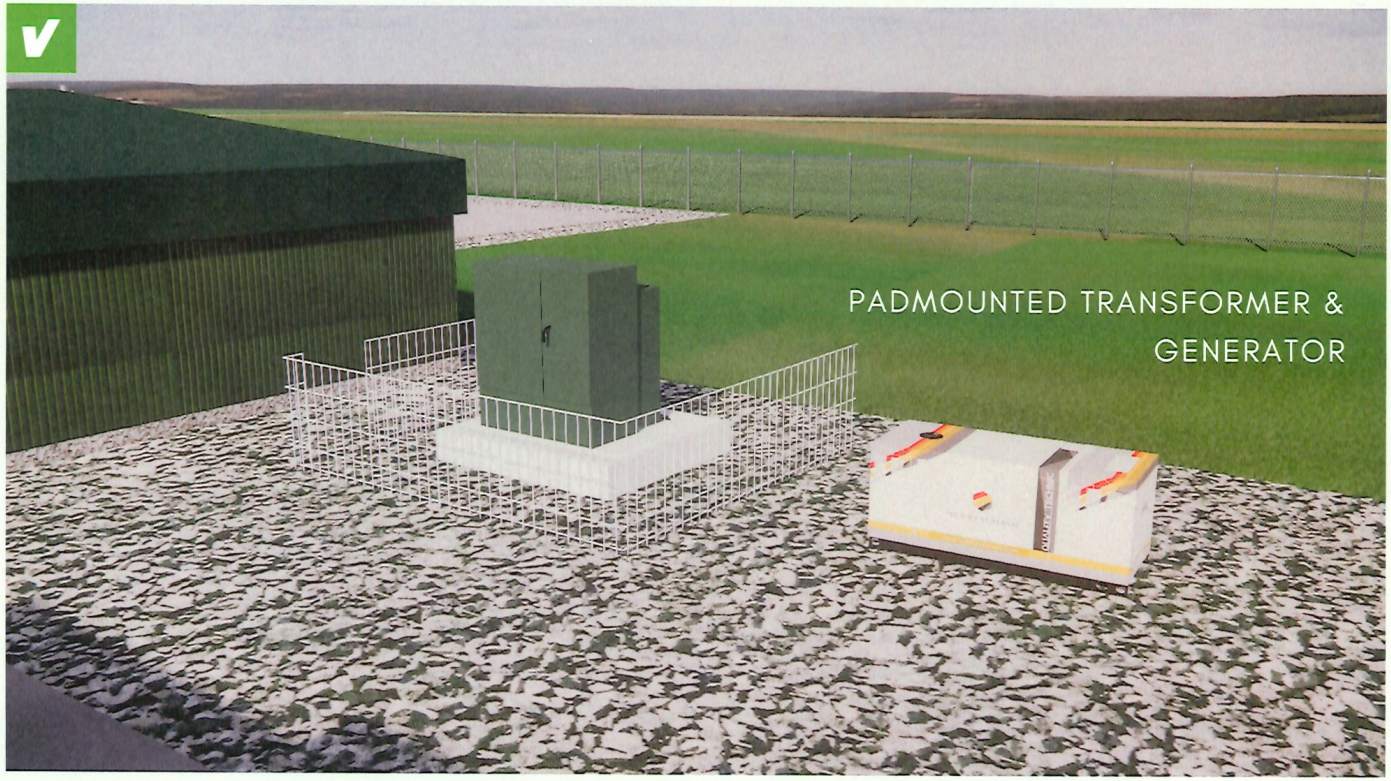

DIGESTER TANKS


HYDROLYSIS,PROCESS
WATER,FIRE WATER TANKS


BOILER & HEAT EXCHANGERS


CAR PARKING


SOLID SEPARATION BUILDING
& EXISTING MANURE PIT


PADMOUNTED TRANSFORMER &
GENERATOR


TRUCK PARKING

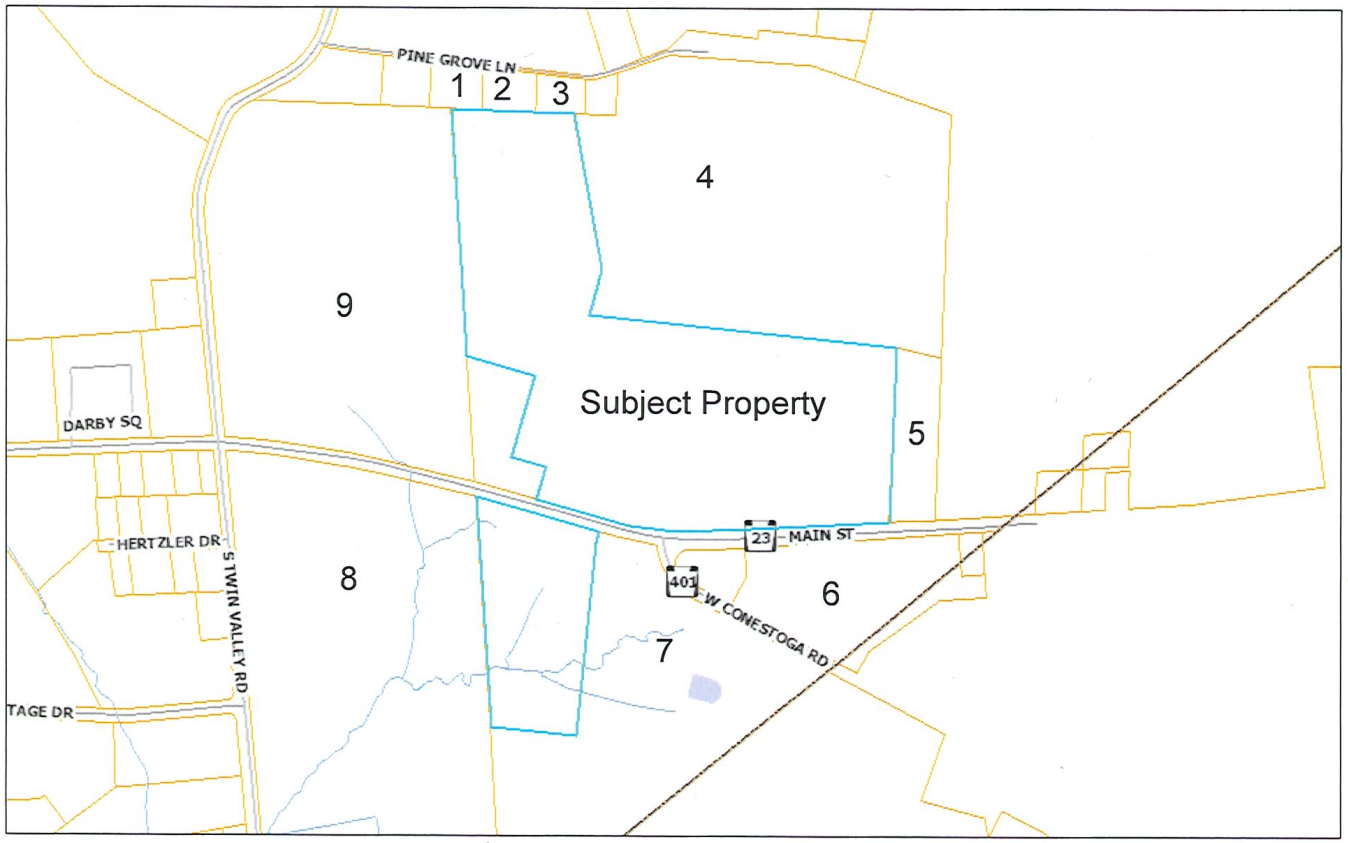

LAGOON


STREET VIEW


STREET VIEW

Exhibit J

Berks County



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0 0.1 0.2 0.4 km

County of Berks

Berks County
Berks County

Adjoining Property Owners

1. 22 Pine Grove Lane - 35533001074128
   Linda M. Elston
   22 Pine Grove Lane
   Elverson, PA 19520

2. 32 Pine Grove Lane - 35533001077147
   Christopher T. Beningo
   32 Pine Grove Cemetery Road
   Elverson, PA 19520

3. 40 Pine Grove Lane - 35533001078166
   Shelby A. Beningo
   40 Pine Grove Lane
   Elverson, PA 19520

4. Route 23 - 35533001167776
   Gary L. & Sharon L. Stoltzfus
   316 Steeplechase Drive
   Elverson, PA 19520

5. 4401 Main Street - 35533001254618
   Athena Clarkin
   4401 Main Street
   Elverson, PA 19520

6. 4456 Main Street - 35533001251036
   Twin Valley Fire Dept.
   PO Box 181
   Elverson, PA 19520

7. 97 Conestoga Road - 35533000144457
   Twin Valley School District
   4851 Twin Valley Road
   Elverson, PA 19520

8. 4350 Main Street - 3553300041817
   Jared S. & Marla J. Kurtz
   4351 Main Street
   Elverson, PA 19520

9. 4351 Main Street - 35533000041817
   Timothy S. & Deborah S. Kurtz
   4350 Main Street
   Elverson, PA 19520