



# Kirkland Appraisals, LLC

Richard C. Kirkland, Jr., MAI  
9408 Northfield Court  
Raleigh, North Carolina 27603  
Phone (919) 414-8142  
[rkirkland2@gmail.com](mailto:rkirkland2@gmail.com)  
[www.kirklandappraisals.com](http://www.kirklandappraisals.com)

February 4, 2025

Ciara Kelleher  
Jupiter Power, LLC  
1108 Lavaca Street, Suite 110-349  
Austin, TX 78701

Ms. Kelleher

I have considered the likely impact of the proposed Voyager Energy Storage System off W. Michigan Avenue, Saline, Washtenaw County, Michigan.

The scope of this assignment is to address the likely impact this use may have on adjoining property values. To this end I have reviewed the site plan and considered the visual and related potential impacts on adjoining properties. I have considered matched pair/paired sales analysis for this study. I have previously considered battery storage in connection with solar farm activity as well as stand alone use similar to this project.

This letter is a real property appraisal consulting assignment. My client is Jupiter Power, LLC, represented to me by Ms. Ciara Kelleher. The intended use is to assist in the Special Use Permit application. The effective date of this consultation is February 4, 2025.

The analysis and data used to form the conclusion is presented on the following pages attached to this summary letter.

## **Conclusion**

Battery storage systems are commonly located in residential areas as shown in the data and there is no indication from these examples of a negative impact on value where there is sufficient separation and/or landscaping screens.

The typical factors that would trigger an impact on value, or external obsolescence, were considered and are shown to be mitigated to protect adjoining property values.

I conclude that the proposed battery storage system with the setbacks as presented will not have a negative impact on adjoining or nearby property values. The distance separating the homes from batteries is supported by market data as having no impact on property values and numerous examples of homes closer than the proposed distance were identified, even in areas with significantly less tree cover or landscaping features like the grass-covered berm that is proposed at this location.

Sincerely,

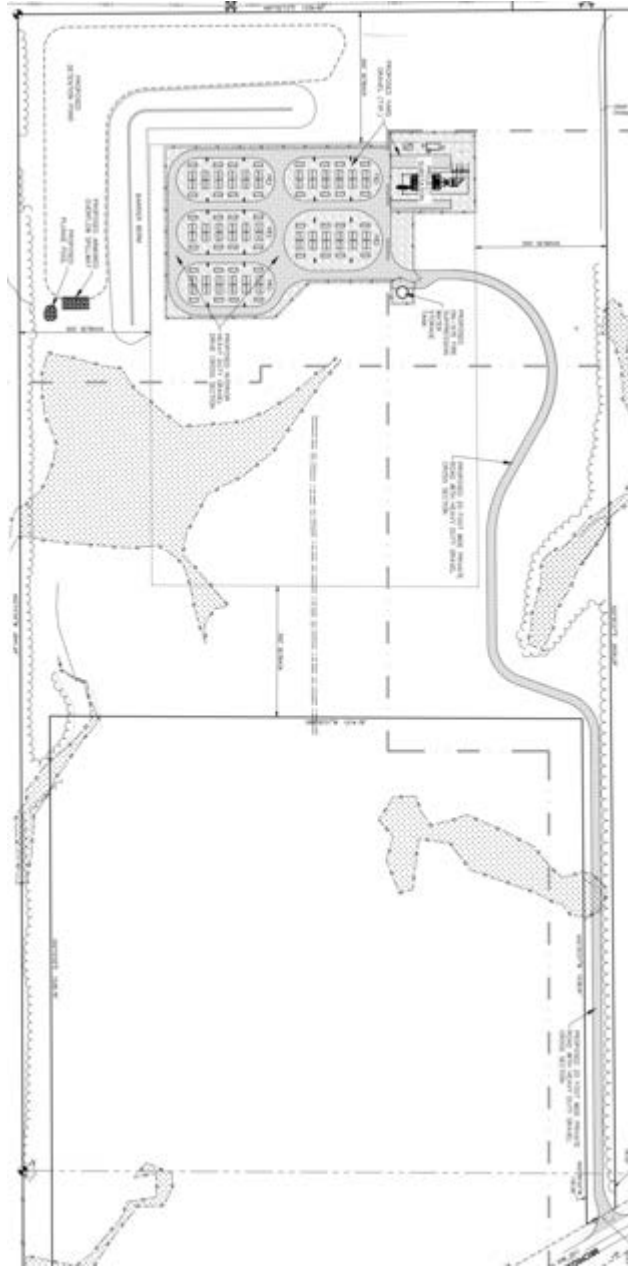


Richard C. Kirkland, Jr., MAI  
NC State Certified General Appraiser #A4359  
MI State Certified General Appraiser #1205076620

## I. Proposed Use Description

The subject property is 5.23 acres out of a parent tract of 54.18 acres north of W. Michigan Avenue, Saline, Michigan. This property is currently a vacant field.

The proposed battery storage will include 120 total battery containers that are 10.5-feet tall and 40 associated transformers clustered near the north end of the parent tract corner as shown below. The entire perimeter of the battery storage area will be fenced in. The proposed batteries will allow for 100 MW for 4 hours, or 400 MWH.



## II. Adjoining Uses

The adjoining uses include a substation to the north at Parcel 3 and the Hammer Trucking Manufacturing property shown as Parcel 10. Otherwise the adjoining existing land uses are primarily a mix of agricultural and residential uses. The distances measured in the chart are to the nearest electrical equipment, but there will be an intervening landscaping as well as shown on the site plan on the prior page.

### Adjoining Use Breakdown

	Acreage	Parcels
Industrial	3.25%	12.50%
Residential	12.06%	31.25%
Agri/Res	40.96%	18.75%
Agricultural	40.19%	31.25%
Utility	3.53%	6.25%
<b>Total</b>	<b>100.00%</b>	<b>100.00%</b>



**Surrounding Uses**

#	MAP ID	Owner	GIS Data		Adjoin		Distance (ft)
			Acres	Present Use	Acres	Parcels	Home/Battery
1	R -18-04-400-001	Finkbeiner	82.06	Agri/Res	17.33%	6.25%	2,960
2	R -18-03-300-004	Finkbeiner	82.70	Agri/Res	17.47%	6.25%	2,880
3	R -18-03-300-005	DTE	16.72	Utility	3.53%	6.25%	N/A
4	R -18-10-200-001	Marion	41.16	Agricultural	8.69%	6.25%	N/A
5	R -18-10-200-001	Schneider	29.18	Agri/Res	6.16%	6.25%	1,750
6	R -18-10-300-002	Roehm	38.54	Agricultural	8.14%	6.25%	N/A
7	R -18-10-300-003	Koshy	49.95	Agricultural	10.55%	6.25%	N/A
8	R -18-10-200-008	Neg	40.91	Agricultural	8.64%	6.25%	N/A
9	R -18-10-300-006	KBK	7.38	Industrial	1.56%	6.25%	N/A
10	R -18-09-400-001	Niethammer	8.02	Industrial	1.69%	6.25%	N/A
11	R -18-09-100-005	Roehm	19.76	Agricultural	4.17%	6.25%	N/A
12	R -18-09-100-007	Meijer	16.59	Residential	3.50%	6.25%	1,305
13	R -18-09-100-011	Clisham	10.07	Residential	2.13%	6.25%	1,175
14	R -18-09-100-010	Rafko	10.12	Residential	2.14%	6.25%	1,160
15	R -18-09-100-009	Roehm	10.17	Residential	2.15%	6.25%	865
16	R -18-09-100-001	Glaspie	10.17	Residential	2.15%	6.25%	775
<b>Total</b>			<b>473.500</b>		<b>100.00%</b>	<b>100.00%</b>	<b>1,609</b>

The closest adjoining home is 775 feet away on Parcel 16. The average distance is 1,609 feet and ranging up to 2,960 feet. These distances are all much further than the examples of similar systems identified in this report. These setbacks coupled with the proposed landscaping between the facility and those homes, including the grass-covered berm serve as substantial mitigating factors.

This closest distances is consistent with the examples of similar systems identified in this report.

### III. Data Set

I started looking for similar projects based on an excel list provided by my client of projects with a BESS component. That list included 670 listings. I sorted that list to only projects over 50 MW and removed all projects that were clearly including a solar, wind or other power production facility as part of that BESS. This left me with the following list of 27 listings. It is notable that the earliest operational date for this set is June 9, 2020 with most of these projects being newer. This is a function of the technology being deployed at this scale only more recently, though the earliest system in the larger set was from December 1, 2003.

Owner Name	Plant Name	Plant State	Commercial Online Date	Storage Capacity MW
Byrd Ranch Storage LLC	Byrd Ranch Storage	Texas	10/21/2022	50.0
GlidePath Power Solutions LLC	Roughneck Storage	Texas	09/30/2022	50.0
KCE TX 11 LLC	Republic Road Storage	Texas	06/15/2022	50.0
KCE TX 13 LLC	Endurance Park Storage	Texas	12/28/2022	50.0
KCE TX 19 LLC	River Valley Storage 1	Texas	07/31/2023	50.0
KCE TX 21 LLC	River Valley Storage 2	Texas	07/31/2023	50.0
Coso Battery Storage LLC	Coso Battery Storage	California	04/01/2022	60.0
Valley Center ESS LLC	Valley Center ESS	California	12/01/2021	139.0
AES ES Alamos Energy Center LLC	Alamos Energy Center	California	01/01/2021	100.0
Astral Energy LLC	Chisholm Grid Battery Storage	Texas	10/01/2021	100.0
Flower Valley II LLC	Flower Valley I - II	Texas	03/30/2022	100.0
Gambit Energy Storage LLC	Gambit Storage	Texas	06/14/2021	100.0
Ignacio Grid LLC	Ignacio Grid	Texas	03/17/2023	100.0
KCE TX 12 LLC	Silicon Hill Storage	Texas	10/31/2022	100.0
Madero Grid LLC	Madero Grid	Texas	03/17/2023	100.0
Swoose II LLC	Swoose 1 & 2	Texas	08/15/2022	100.0
Bat Cave Energy Storage LLC	Bat Cave Storage	Texas	10/22/2021	100.50
North Fork Energy Storage LLC	North Fork (TX)	Texas	10/22/2021	100.50
Lockhart ESS LLC	SEGS VIII	California	07/01/2023	109.0
Lancaster Area Battery Storage LLC	Lancaster Battery Storage	California	09/02/2022	127.0
North Central Valley Energy Storage LLC	North Central Valley Energy Storage	California	08/01/2023	132.0
ES 1A Group 2 Opco LLC	Edwards & Sanborn	California	08/01/2022	144.0
Wolf Tank Storage LLC	Wolf Tank Storage	Texas	07/18/2023	155.480
Acciona Energy USA Global LLC	Turquoise Storage	Texas	07/26/2023	196.210
Diablo Energy Storage LLC	Diablo Energy Storage	California	04/01/2022	200.0
Crossett Power Management LLC	Crossett Power	Texas	05/26/2022	200.0
Gateway Energy Storage LLC	Gateway Energy Storage	California	06/09/2020	250.0

I used this as a starting point in identifying projects similar to the subject. I have not researched all of these examples, though I did identify the locations of most of these. I have examples shown later in this report that came from earlier analysis looking at such facilities identified in a different manner. I have additional projects shown later that are not included in this list above.

#### **IV. Similar Projects**

I considered the following battery storage facilities in a variety of states for a comparison of similar battery energy storage systems (BESS) in proximity to residential uses. I have also searched these areas for recent sales to see if there is any impact on property values near these battery storage facilities, which will be addressed in the following section.

The primary use of this larger set is to show compatibility of BESS and residential uses as well as showing typical setbacks between these uses. These measured distances are from the closest point on the home to the closest piece of equipment. Where I have N/A, the facility does not have an aerial image that I can use to measure that distance. These distances were measured using GoogleEarth.

I note that the proposed distances at the subject property are much further away than many of the other identified projects. The average distance identified is 360 feet with a median distance of 295 feet, whereas the subject property will be 700 feet from the nearest home.

## Summary of Battery Data

#	Name	City/State	Acres	Capacity	Distance from Average Distance	
					Closest Home	Adjoining Home
0	Subject	Saline, MI	7.7	100 MW	775	1,609
1	Medway Grid	Medway, MA	10.6	250 MW	150	N/A
2	Diablo	Concord, CA	11.45	200 MW	320	361
3	Fort Watt	Fort Worth, TX	47.94	200 MW	515	1,412
4	Cranberry	Carver, MA	34	150 MW	680	N/A
5	N Central Valley	Stockton, CA	N/A	132 MW	N/A	N/A
6	Silicon Hill	Pflugerville, TX	N/A	100 MW	350	N/A
7	Bat Cave	Mason, TX	N/A	101 MW	N/A	N/A
8	Gambit	Angleton, TX	6.24	100 MW	215	243
9	Chisholm	Ft Worth, TX	21.74	100 MW	840	875
10	Roughneck	W. Columbia, TX	4.55	50 MW	1,095	N/A
11	Vista	Vista, CA	0.88	40 MW	130	172
12	Outer Cape	Provincetown, MA	N/A	25 MW	435	N/A
13	West Chicago	Chicago, IL	5	20 MW	430	450
14	McHenry	McHenry, IL	2.75	20 MW	260	283
15	Plumstead	Hornerstown, NJ	14.39	20 MW	155	943
16	Rush Springs	Marlow, OK	N/A	10 MW	N/A	N/A
17	Prospect	W. Columbia, TX	2.3	10 MW	400	400
18	Brazoria	Brazoria, TX	17.58	10 MW	130	438
19	Churchtown	Pennsville, NJ	3.13	10 MW	N/A	N/A
20	Port Lavaca	Prt Lavaca, TX	1.44	10 MW	N/A	N/A
21	Magnolia	Houston, TX	0.87	10 MW	180	190
22	Rabbit Hill	Georgetown, TX	5.99	10 MW	130	338
23	Asheville	Asheville, NC	12.36	9 MW	130	452
24	Micanopy	Micanopy, FL	22.5	8.25 MW	605	1,085
25	East Hampton	E. Hampton, NY	17.58	5 MW	470	733
26	Beebe	N/A	N/A	3 MW	N/A	N/A
27	Ozone Park	Queens, NY	0.35	3 MW	30	203
28	Pomona	Rockland, NY	28.5	N/A	270	1196
		<b>Average</b>		42 MW	360	575
		<b>Median</b>		20 MW	295	438
		<b>High</b>		200 MW	1,095	1,412
		<b>Low</b>		3 MW	30	172

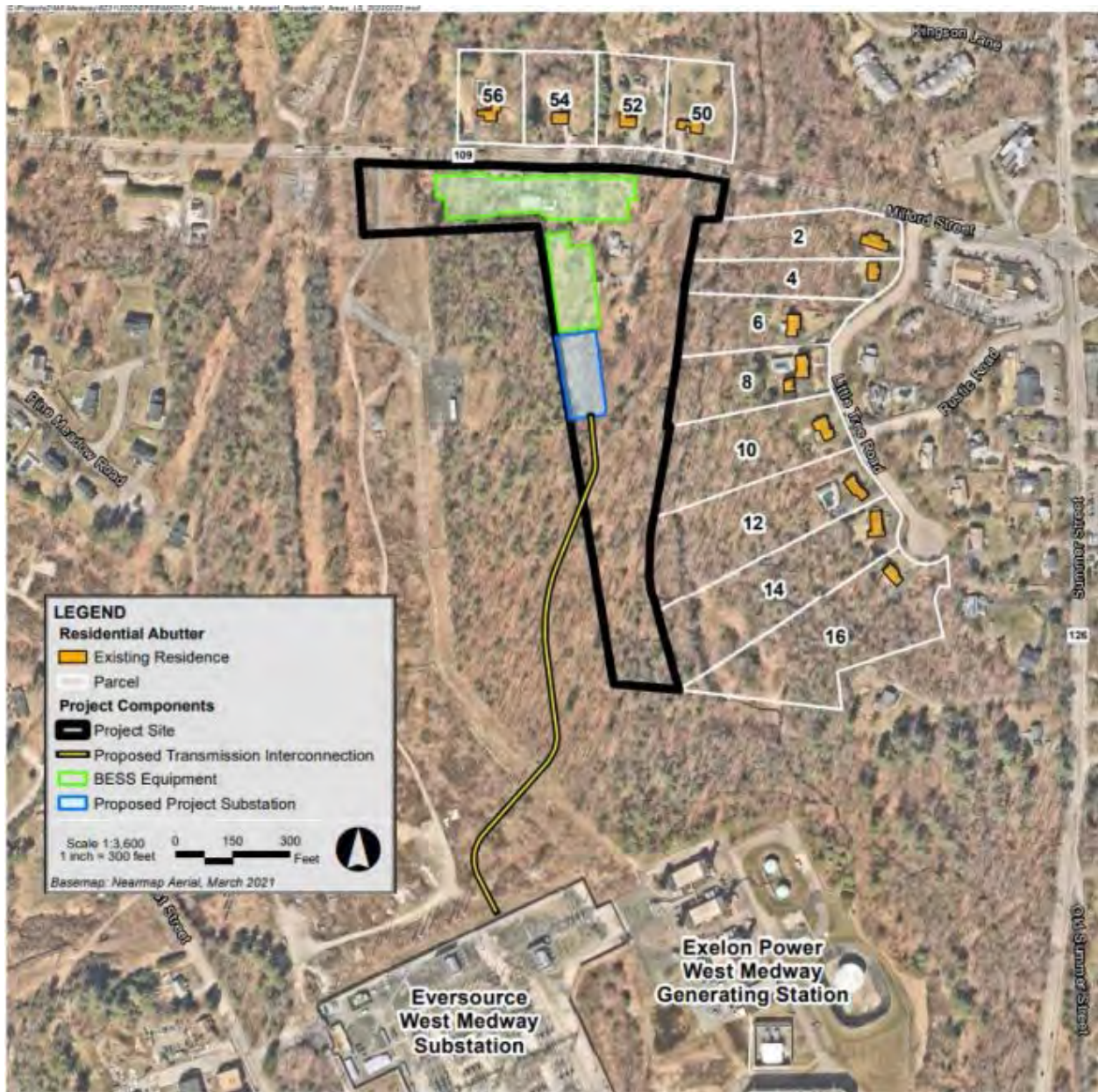


## V. Market Data

I considered the following battery storage facilities in a variety of states where I was able to identify adjoining residential home sales. These home sales were then compared to similar homes in the area that sold in the same time frame but were not in proximity to the BESS. This is called a paired sales analysis and I have used this to determine if there is any impact that could be attributed to the adjacency/proximity to the BESS.

### 1 – Medway Grid

This 250 MW battery storage system is proposed for Medway, Massachusetts. This is located on a portion of 10.6 acres. The closest adjoining home will be 150 feet away to the north.



## 2 - Diablo Energy Storage System

This 200 MW battery storage system is located on a parcel with significant adjacency to industrial uses and residential uses. For these reasons it would be difficult to measure impacts due to the adjoining industrial uses that might also have an impact. Given that most of the adjoining uses are industrial, I have not dug further on this one.



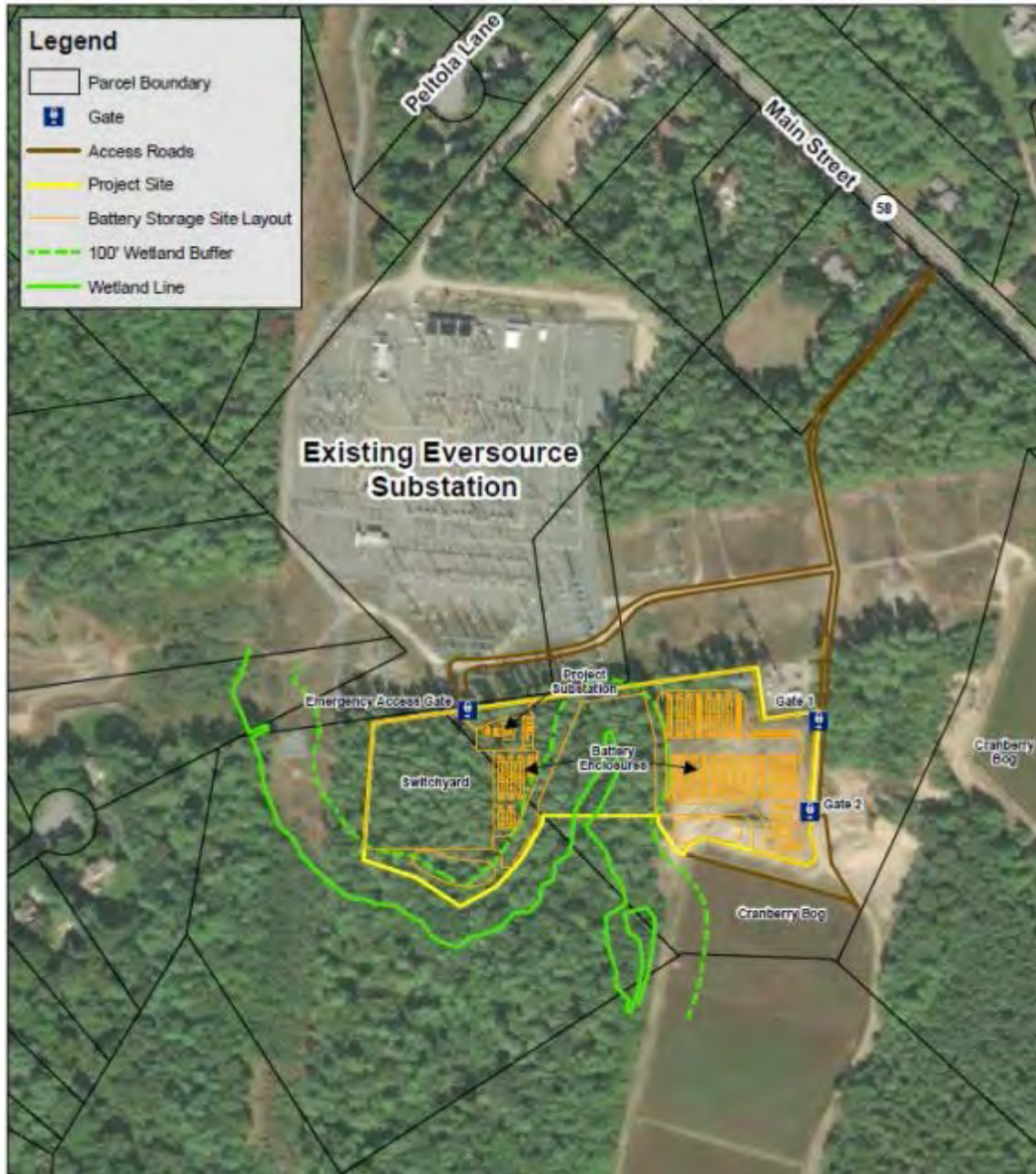
**3 – Fort Watt Storage**

This 200 MW/400 MWh battery storage system is located near Fort Worth, TX and is proposed to be built in 2024.



#### 4 – Cranberry Point Energy Storage

This 150 MW battery storage system is proposed for Carver, Massachusetts. This is located on 6 acres out of 34-acre parent tracts. The closest adjoining home will be 680 feet away to the west.



## 5 - North Central Valley Energy Storage

This 132 MW battery storage system is located near Stockton California in the San Joaquin Valley. The map below shows the approximate area as this became operational in August 2023 and no aerial imagery of the battery facility was available.



## 6 - Silicon Hill Storage

This 100 MW battery storage system is located off Cameron Road, Pflugerville, Texas. There have not been any adjoining home sales since it was built so no analysis is currently possible. The closest adjoining home is 350 feet from the BESS equipment.



## 7 – Bat Cave Energy Storage

This 100.5 MW battery storage system is located near Mason, Texas and was built in 2021.



## 8 - Gambit Energy Storage

This 102.4 MW battery storage system is located off W. Live Oak Street, Angleton, Texas. This is a new facility and placed online in June 2021. This system is a good location as there are no other externalities adjoining it to potentially impact the analysis. The substation associated with this is located to the east along N. Walker Street.



The adjoining homes to the north were selling with new homes ranging from \$400,000 to \$600,000 in 2022.

The most recent adjoining home sale to the west was 852 Marshall Road that sold on April 5, 2021 and presumably they were aware of the battery storage facility as it would have been under construction at the time of sale. This brick ranch with 3 BR, 1 BA with 1,220 s.f. of gross living area and built in 1980 on 0.40 acres sold for \$165,000, or \$135 per s.f.

I have compared that sale to 521 Catalpa Street that sold on September 11, 2020 for \$155,000 for a 3 BR, 2 BA brick ranch with 1,220 s.f. built in 1973 with a single car garage. Adjusting this price upward by 9% for growth in the market for time, 3.5% for difference in age, downward by \$6,000 for the additional bathroom, and \$4,000 for the garage, the adjusted indicated value of this home is \$164,375, which is right in line with 852 Marshall Road and supports a finding of no impact on property value.

I have also compared that sale to 521 W Mimosa Street that sold on February 26, 2021 for \$150,000 for this brick ranch with 3 BR, 1.5 BA with 1,194 s.f. built in 1976. Adjusting this sale upward by 4% for growth in the market over time, upward 2% for difference in age, and downward by \$5,000 for the additional half bathroom, I derive an adjusted indication of \$154,000. This is 7%



less than the home price at 852 Marshall Road which suggests an enhancement due to proximity to the battery storage system.

I have also compared this sale to 1164 Thomas Drive that sold on May 20, 2020 for \$187,000 for this brick ranch with 2-car garage, 3 BR, 2 BA with 1,259 s.f. and built in 1998. Adjusting this upward by 13% for growth over time, downward by 9% for difference in age of construction, downward by \$8,000 for the garage, downward \$6,000 for the additional bathroom, I derive an indicated value of \$180,480. This is a 9% difference suggesting a negative impact on property value. However, this comparable required the largest amount of adjustments and is not considered as heavily as the other two comparables. This home is 18 years newer and with better bathroom situation as a 1-bathroom house is a significant issue for most buyers.

The second comparable considered required the least adjustment and suggests a positive impact on property value. The median indication is the first comparable which shows no impact on property value. Given this data set I conclude that the best indication from these matched pairs supports a finding of no impact on property value. The home at 852 Marshall is 180 feet from the project outline shown.

## 9 - Chisholm Grid Energy Storage

This 200 MW battery storage system is located at 9400 Asphalt Drive, Fort Worth, Texas. This is a new facility and in close proximity to those homes near the substation.

The property to the west of the BESS is an asphalt plant with a lot of vacant land separating the homes from the active plant. Still this complicates any analysis of this from an impact analysis standpoint. I therefore have not attempted to do so.



## 10 - Roughneck Storage

This 50 MW battery storage system is located off Hogg Ranch Road, West Columbia, Texas. There have not been any adjoining home sales since it was built and commercial/industrial uses in the vicinity would make it challenging for analysis in any case. The closest adjoining home is 1,095 feet from the BESS equipment.



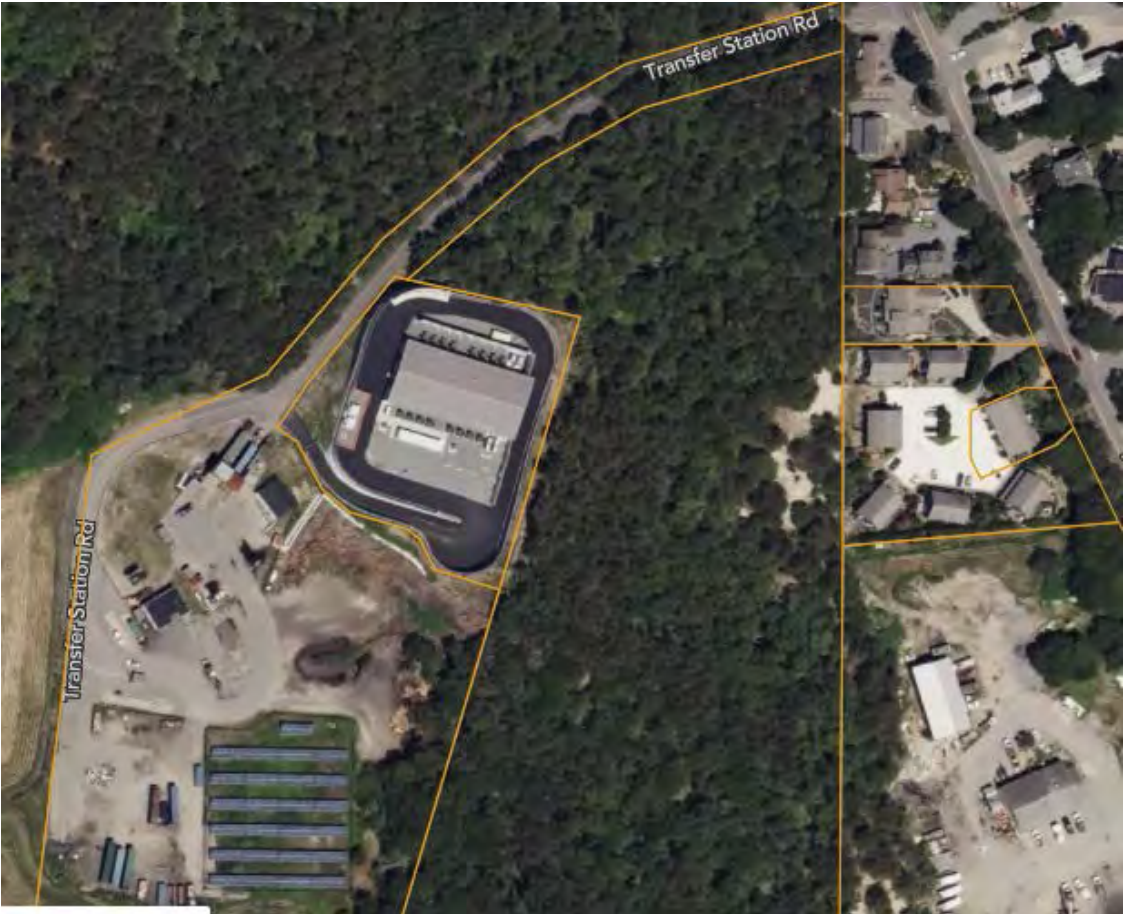
**11 - Vista Energy Storage System**

This 40 MW battery storage system is located off Olive Avenue, Vista, California. This facility has significant commercial development around it but also housing to the south as close as 115 feet from the closest equipment as shown in the aerial map below.



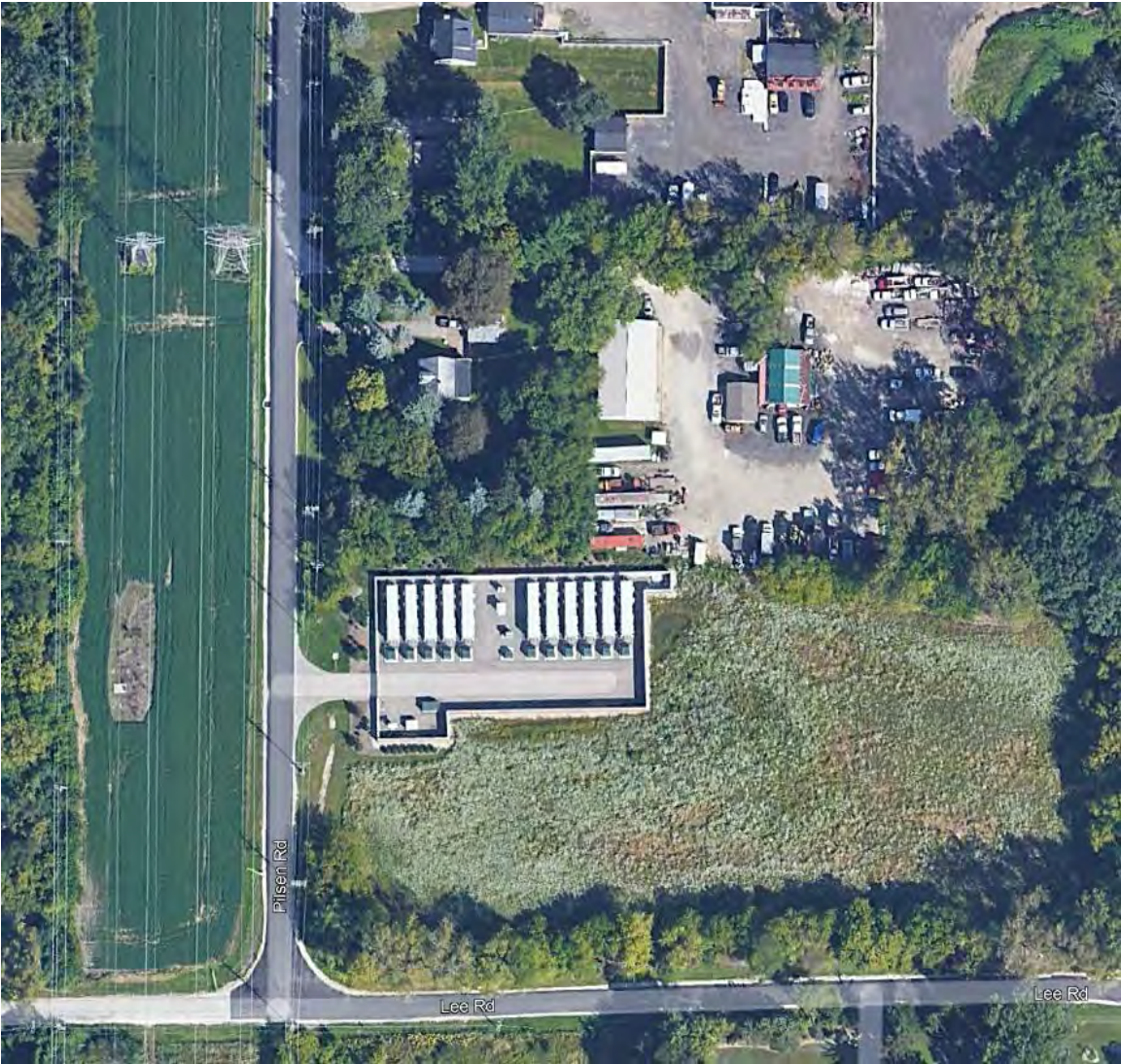
**12 – Outer Cape Community**

This 25 MW battery storage system is located in Nantucket, Massachusetts. This adjoins an industrial building, small solar farm and small landfill. There are nearby houses to the east as close as 435 feet. The closest home sold on November 28, 2023 after the batteries were put in place for \$1,750,000 for this 2,454 s.f. home. I attempted a paired sales analysis but given the proximity to those other uses it was not possible to isolate those other possible issues from comparable sales. The best way to isolate those issues would be a Sale/Resale analysis of the same home, but the next earliest sale of this home was too far back for a valid Sale/Resale analysis.



**13 - West Chicago Battery Storage**

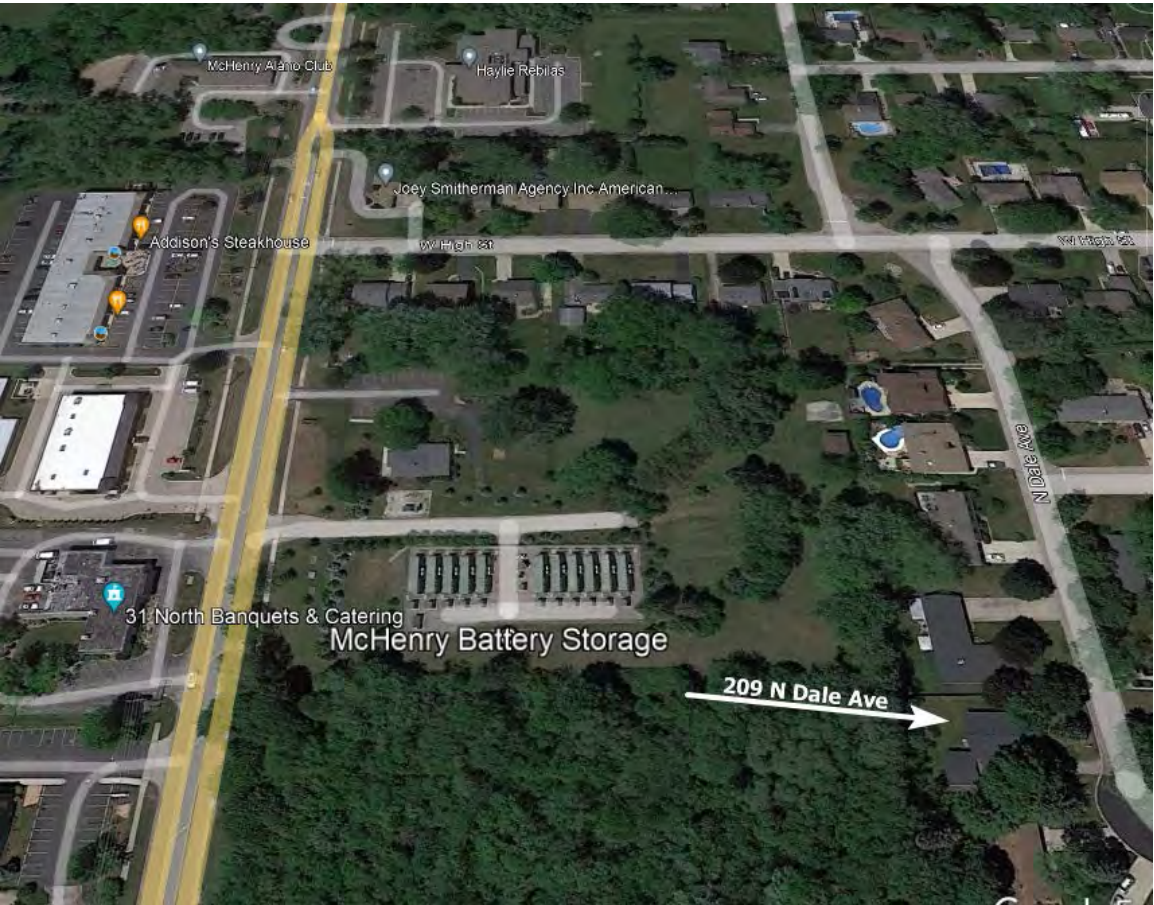
This 19.8 MW battery storage system is located off Pilsen Road, Chicago, Illinois. This facility has condominium and single family housing to the north and single family housing nearby to the south, but also adjoining an outdoor storage area and a large powerline easement. I was not able to do any analysis on this site as there have been no recent sales identified.



**14 - McHenry Battery Storage**

This 19.8 MW battery storage system is located off Illinois Highway 31, McHenry, Illinois that was built around 2016. This is facility fronts on the highway but has rear adjacency to a number of houses.

There were two recent home sales along W. High Street, but they effectively adjoin the small commercial use between the battery storage facility. That complication makes it difficult to determine if the commercial use was the impact or if the commercial use buffered any impact making any finding off of analysis suspect and uncertain.



I have however considered the recent sale of 209 N Dale Avenue that adjoins the battery storage site and is 290 feet from the nearest equipment.

That home sold on June 30, 2021 for \$265,000 for a vinyl-siding ranch with 3 BR, 2.5 BA, built in 1960 with a gross living area of 1,437 square feet, or \$184.41 per s.f. The property has 5 attached garage spaces. As identified in the listing the home was completely renovated with stainless steel appliances and granite countertops. This was listed by Lynda Steidinger with Berkshire Hathaway HomeServices Starck Real Estate and the buyer's agent was Ivette Rodriguez Anderson with Keller Williams. The heavy renovations make it impossible to do a Before and After analysis, so I have looked at paired sales instead.

The home directly across the street, 208 N Dale Avenue, sold on June 16, 2021 for \$275,000 for a cedar siding and stone ranch with 3 BR, 2.5 BA, built in 1961, with a gross living area of 1,446 s.f., or \$190.18 per s.f. This home also has 1,101 square feet of finished basement space that is

currently used as an office but could be an additional bedroom. This home also has been updated and includes stainless steel appliances and granite counter tops.

The size difference is nominal and the additional 3-car garage bays at the 209 N Dale is considered to be balanced by the finished basement space at 208 N Dale, though the finished office space is somewhat superior to garage space. But balancing those two factors out the difference in price per square foot is 3%. This is considered negligible and attributable to the slightly superior finished basement space and not any impact relative to the battery storage facility.

I also looked at 3802 Clover Avenue, which is two blocks to the north. This stone and siding ranch with 3 BR, 2 BA, built in 1956, with a gross living area of 1,200 s.f. sold on October 21, 2021 for \$231,000 or \$192.50 per s.f. The property has been updated with a new kitchen and a new bay window and includes a partially finished basement with an additional bathroom in it and the total basement area is an additional 1,200 s.f. This is the smallest home in the neighborhood that I found and it further illustrates that the price per square foot typically goes up as the size goes down. Adjusting this gross sale price upward by \$36,498 for the smaller size based on 80% of the price per square foot for this purchase, I derive an adjusted sales price to compare to the subject property of \$267,498. I consider the basement to balance out the extra garage space at the subject. This indicates a difference of 1% from the purchase price of the 209 N Dale Avenue, which is attributable to the 4 months difference in time. I consider this comparable to further support a finding of no impact on value.

There are numerous recent home sales in the neighborhood ranging from \$172,000 to \$306,000, but most of these homes are also over 2,000 square feet in size. The subject property sold for more per square foot than most of these other sales partly due to the smaller overall size, partly due to the significant renovations, and partly due to the additional garage space. Still, this shows that the 209 N Dale Avenue sale is not being impacted by the battery storage facility and has in fact been updated above what is typical for the neighborhood, though given the similar updates at 208 N Dale Avenue, this may be the trend for the area.

The two sales compared to the 209 N Dale Avenue sale supports a finding of no impact on property value due to the battery storage facility.

I also looked at a more recent sale of 205 N Dale Avenue which adjoins 209 N. Dale to the south. This home sold on May 31, 2023 for \$255,000 for this 3 BR, 2 BA home with 1,592 s.f. with a 2-car garage built in 1962 on a 0.40-acre lot. This home sold earlier that year for significantly less and underwent heavy renovations. The property was advertised as backing up to woods, it is 1 lot off adjacent to the BESS and shows no sign of impact.



**15 - Plumsted Energy Storage**

This 19.8 MW battery storage system is located on Monmouth Road, Cream Ridge, New Jersey. There is only one adjoining home as shown in the image to the south, but it is located just 148 feet from the nearest piece of equipment and 96 feet from the fence line. There were existing trees, but they were supplemented with a 12-foot wooden privacy fence with smaller evergreens between the fence and property line. The privacy fence at this location is oversized as the battery units include HVAC units on top of the battery pods that extend the height of the units greater than required at the subject property. The road frontage was not landscaped and chain link fencing was used on the rest of the property.

The adjoining home at 797 Monmouth Road has not sold recently and no further analysis is possible at this site.



**16 – Rush Springs Storage**

This 10 MW battery storage system is located near a windfarm on SR 1600 near Marlow, Oklahoma. There have not been any adjoining home sales since it was built so no analysis is currently possible. The closest adjoining home is 660 feet from the BESS equipment.



**17 – Prospect Energy Storage System**

This 10 MW battery storage system is located on a parcel adjoining a large substation in Brazoria, TX. The only adjoining home is 400 feet away. This home has not sold since the BESS was completed in 2019. Furthermore, this home has an unobstructed view of the substation which would make it a difficult home for impact analysis.



### 18 – Brazoria Energy Storage System

This 9.95 MW battery storage system is located on a parcel adjoining multiple homes within 150 feet of the battery equipment. There have been no recent sales since this was built in 2020.



## 19 - Churchtown Battery Storage

This 10 MW battery storage system is located off N. Broadway, Pennsville, NJ. The aerial imagery does not show this system yet so I was not able to determine distances to adjoining homes or identify any adjoining homes. Given the large substation, adjoining baseball fields and religious facilities this would be a challenging site for an impact analysis in any case.



## 20 - Port Lavaca BESS

This 9.9 MW battery storage system is located in Port Lavaca, Texas. It was built in 2020 and is entirely surrounded by agricultural and utility uses. I have not attempted any impact analysis on this facility.



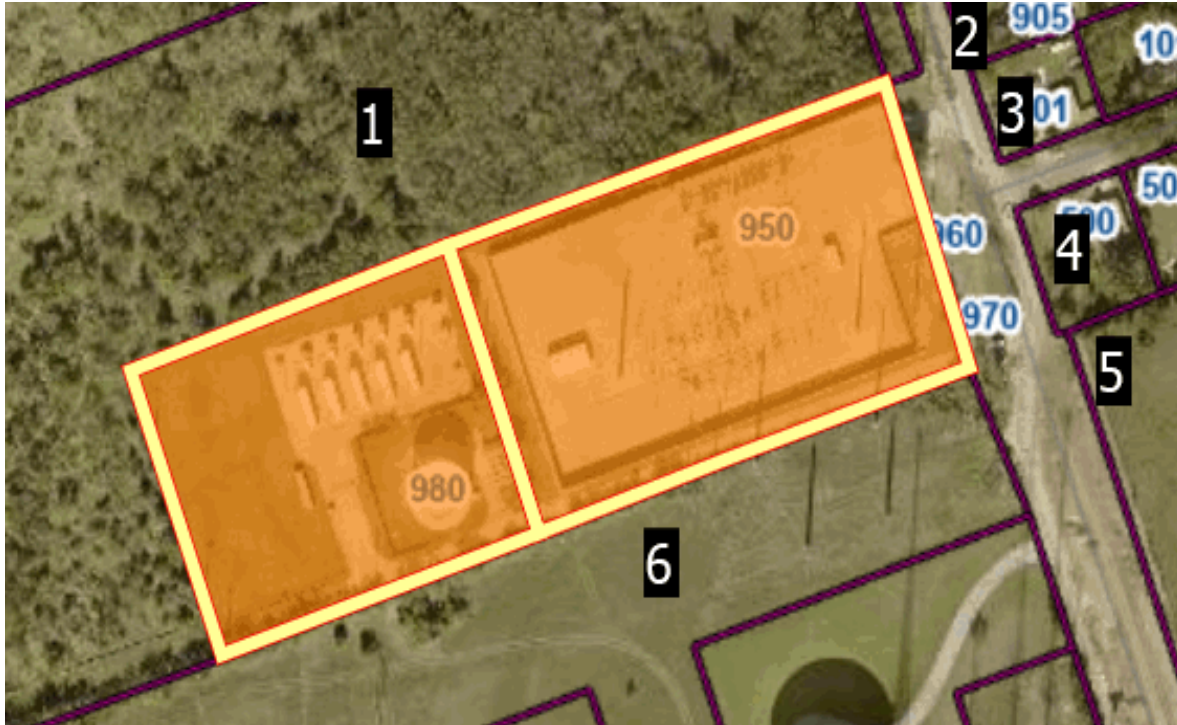
**21 - BRP Magnolia BESS**

This 9.95 MW battery storage system is located off Floyd Road, League City, near Houston, Texas. There have not been any adjoining home sales since it was built so no analysis is currently possible. The adjoining homes are between 180 and 200 feet from the BESS equipment.



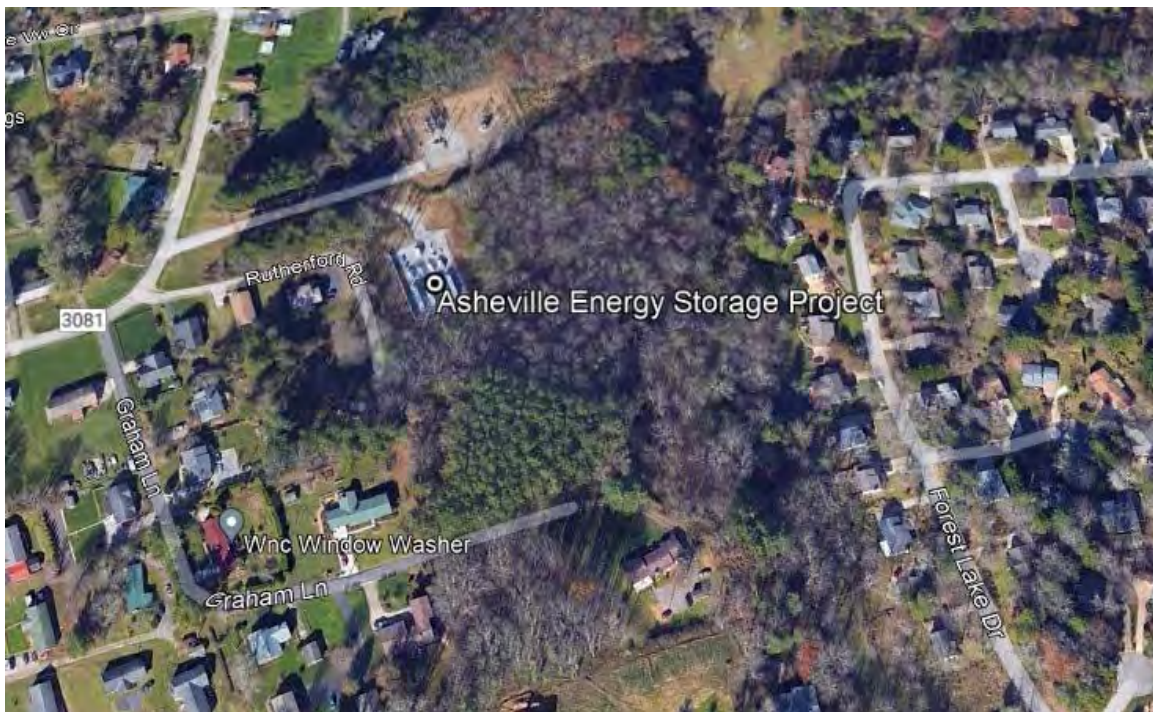
## 22 –Rabbit Hill Storage

This 10 MW battery storage system is located near Georgetown, TX was built in 2020 with the closest home being 130 feet away.



### 23 - Asheville Energy Storage System

This 9 MW battery storage system is located on a parcel with a substation built in 2020 (substation was built much earlier). This facility has significant residential development around it but no recent sales to consider.





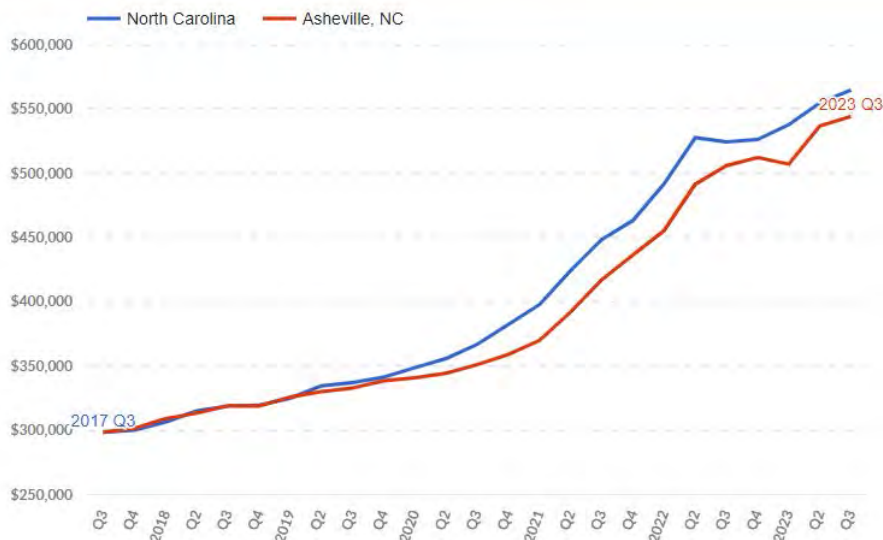
There is a nearby home sale that is located on Tax Parcel 8047 (just below the identifier for Parcel 9). This home is 550 feet from the nearest battery equipment and most of that distance is heavily wooded. This home has a street address of 95 Forest Lake Drive, Asheville, NC and it sold on April 26, 2022 for \$510,000 for this 4 BR/3 BA ranch with 1,931 square feet including the daylight basement area. The home also has a 2 car garage. I did not attempt a paired sale as this home has no visibility of the BESS despite the proximity and arguably has a better view with less screening to the substation, which is also closer to the home.

Similarly, new homes are being built to the south on Ranglely Drive with prices ranging from \$431,000 to \$566,000. These homes include those that back up to the Parcels 11 through 14 in the adjacent parcel map.

Also, Parcel 4 sold in March of 2022, but it has the substation between it and the BESS, which makes it challenging to draw conclusions from and I attempted no analysis.

I did look at 129 Graham Lane, Asheville, which is adjoining Parcel 11. It sold on November 6, 2023 for \$550,000 for this 4 BR, 3 BA home with 2,913 s.f. with a 2 car garage built in 1970 on a 1.21-acre lot. This home last sold on August 2, 2017 for \$298,500 prior to the BESS being constructed. Adjusting this earlier sale using the Federal Housing Finance Agency Home Price Index over that time period, homes in the area indicate that the home should have appreciated to \$544,000 as shown below. The home actually sold for slightly more than this which supports a finding of no impact on property value. This home was 510 feet from the BESS and was screened.

Purchase Quarter	Valuation Quarter	Percentage Change
2017 Quarter 3	2023 Quarter 3	82.2%
Purchase Value	Estimated Value for MSA	
\$298,500	\$544,000	



## 24 – Micanopy

This 8.25 MW battery storage system is located at 304 NE US Highway 441 in Micanopy Florida on a 2.53 acre parcel for an 8.25 MW BESS with an 11.7 MWh capacity built in 2022. The closest adjoining home is 250 feet away. I did not identify any recent home sales.



## 25 - East Hampton Energy Storage System

This 5 MW battery storage system is located on a parcel with a substation and a natural gas peaker plant. This makes it difficult to use for analysis given the multiple uses on this parcel, but I have included a visual of homes in the general area that have sold recently for reference. There is significant wooded acreage separating this BESS and nearby homes.



## 26 – Beebe Substation Battery Storage

This 3 MW battery storage system is in Wakefield, Massachusetts built in 2019. The closest adjoining home is 150 feet away to the southwest.

I looked at 4 Twilight Road to the south that is 600 feet away. It sold in September 2023, but that home is closer to a large powerline easement that makes it difficult to complete a paired sales analysis.

I also looked at 22 Pheasant Wood Drive that sold on August 2023 for \$1,050,000 for a 3,038 s.f. brick ranch with 3 BR, 3.5 BA, 2 car garage built in 1992 on 0.33 acres. This home has a finished basement with a full in-law suite with kitchen. The price per square foot works out to \$345.62. This home is 480 feet to the north of the battery system.

I have compared this to 7 June Circle that sold December 2023 for \$1,109,000 for a 3,473 s.f. 2 story home built in 1971 on 0.36 acres. The home has 5 BR, 4.5 BA, 2 car attached garage and 2 car detached garage with finished basement and a pool. The purchase price works out to \$319.32 per s.f. Adjusting this price upward by 10% for the difference in year built, this price is adjusted to \$351.24 per s.f. This is within 1.6% of the Pheasant Wood sale and supports a finding of no impact on value.



## 27 - Ozone Park Batteries

This system is located on 99<sup>th</sup> Street in Jamaica, Queens, New York. The below image shows the battery pack parcel outlined in red with a bowling alley to the north, a school to the south and homes to the east and west as well as a church to the west. Based on aerial imagery, this site was installed in early to mid-2018.

The two closest structures are the school at 65 feet and a church at 30 feet from the batteries. The nearby homes are on the opposing blocks, but the proximity to the school does illustrate a high confidence in public safety related to the battery facility and acceptance within that community.



**Surrounding Uses**

#	Address	GIS Data		Adjoin		Distance (ft)
		Acres	Present Use	Acres	Parcels	Home/Battery
1	98-18 Rockaway	0.76	Bowling	11.69%	6.67%	N/A
2		0.95	Office	14.62%	6.67%	N/A
3	10735 100th St	0.06	Residential	0.92%	6.67%	245
4	10737 100th St	0.06	Residential	0.92%	6.67%	260
5	10739 100th St	0.06	Residential	0.92%	6.67%	275
6	10741 100th St	0.06	Residential	0.92%	6.67%	290
7	10743 100th St	0.06	Residential	0.92%	6.67%	305
8	10915 98th St	3.74	School	57.54%	6.67%	65
9		0.27	School	4.15%	6.67%	N/A
10	10656 98th St	0.06	Residential	0.92%	6.67%	200
11	10654 98th St	0.06	Residential	0.92%	6.67%	195
12	10650 98th St	0.06	Residential	0.92%	6.67%	190
13	10646 98th St	0.06	Residential	0.92%	6.67%	190
14	10636 98th St	0.06	Residential	0.92%	6.67%	195
15	10645 (8th St	0.18	Church	2.77%	6.67%	30
<b>Total</b>		<b>6.500</b>		<b>100.00%</b>	<b>100.00%</b>	203
						<b>Min</b> 30

The closest recent home sale is 10726 101<sup>st</sup> Street that sold on October 9, 2018, after the battery storage facility was installed. This home is 345 feet from the closest battery and has a very obstructed view of that area based on the shrubs around the battery storage site as well as a strip of landscape greenery between the two sites. The sales price was \$600,000 for this 3 BR/1.5 BA home that was built in 1930 on a 0.06-acre site.

I compared this to a similar home built in 1930 in the same style and same size that sold at 10762 101<sup>st</sup> Street on October 9, 2018 for \$590,000. This home is just down the street but further from the battery storage system and sold on the same day for \$10,000 less. The proximity to the battery does not correlate to value impact in this instance as the home further away sold for less. This second home is across the street from the three-story John Adams High School which likely accounts for the lower price for this second property compared to the first which was adjacent to the same school, but not across from the building itself.

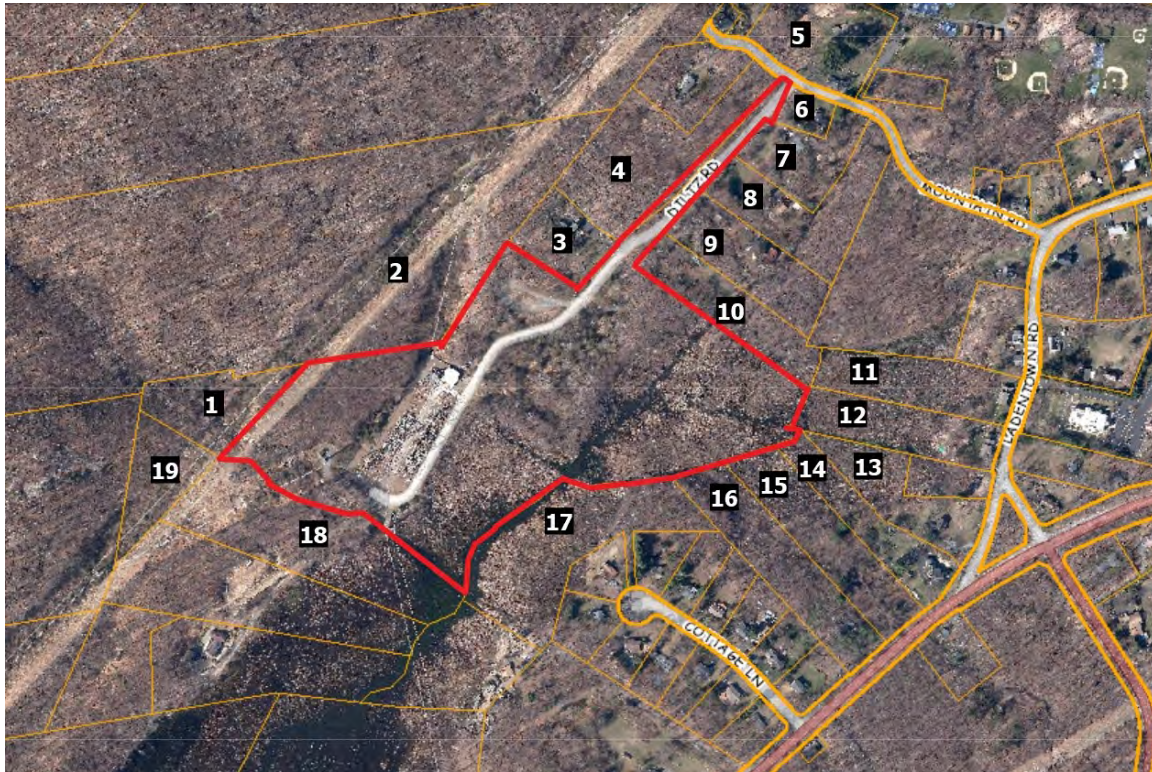
The matched pairs support a finding of no impact on value due to proximity to the battery system.

## 28 - Pomona Batteries

This battery storage system is located at 23 Diltz Road, Pomona, Rockland, New York. This location is more remote than the other system with greater distances separating homes from batteries, but all of the adjoining uses are residential or park. This battery site is located at the end of a road for estate-like homes on large acreage adjoining or in close proximity to Harriman State Park. There are some sales on Dritz Road adjoining the battery site and none of the broker statements identify that as a concern. But given the park, the Mahwah River exposure it is difficult to use these sales for matched pairs as there are too many unique factors and matched pairs require one unique factor.

Most recently I identified an October 11, 2022 sale of adjoining Parcel 4 that sold for \$500,000 for a 4.57-acre estate lot. This home adjoins Harriman State Park and the listing makes no mention of the nearby battery energy storage facility.

The site shows harmonious use in connection with residential uses. The closest identified home is 270 feet.



## **Summary**

I was able to complete paired sales analysis on four of these situations with data coming from Ozone Park in NY, Asheville in NC, Gambit in TX, McHenry in IL, and Wakefield, MA.

The paired sales analysis identifies no impact on adjoining properties based on actual home sales adjoining similar projects.

Many of the situations identified showed homes in similar situations to the subject property where there is a large substation and powerlines nearby with no impact attributable to the inclusion of the BESS.

The sales data supports a finding of no impact on property value for homes ranging from 180 to 600 feet from the nearest equipment with a median distance of 345 feet.

The closest home to the proposed facility is 775 feet, which is at the high end of the range of the paired sales. The comparable sale at Gambit BESS in Angleton, TX was at 180 feet but had minimal intervening trees, whereas the subject property is proposing to keep a much denser intervening and existing tree buffer between the homes and the proposed BESS.

I conclude that based on the comparable and data presented that the proposed facility will not have a negative impact on adjoining property values. Furthermore, there are numerous examples in the data set of homes that are much closer than that distance to batteries which reinforces the opinion developed based on the paired sales analysis and sale/resale analysis.



## **VI. Specific Factors Related To Impacts on Value**

I have completed a number of Impact Studies related to a variety of uses and I have found that the most common areas for impact on adjoining values typically follow a hierarchy with descending levels of potential impact. I will discuss each of these categories and how they relate to a battery energy storage system.

1. Hazardous material
2. Odor
3. Noise
4. Traffic
5. Stigma
6. Appearance

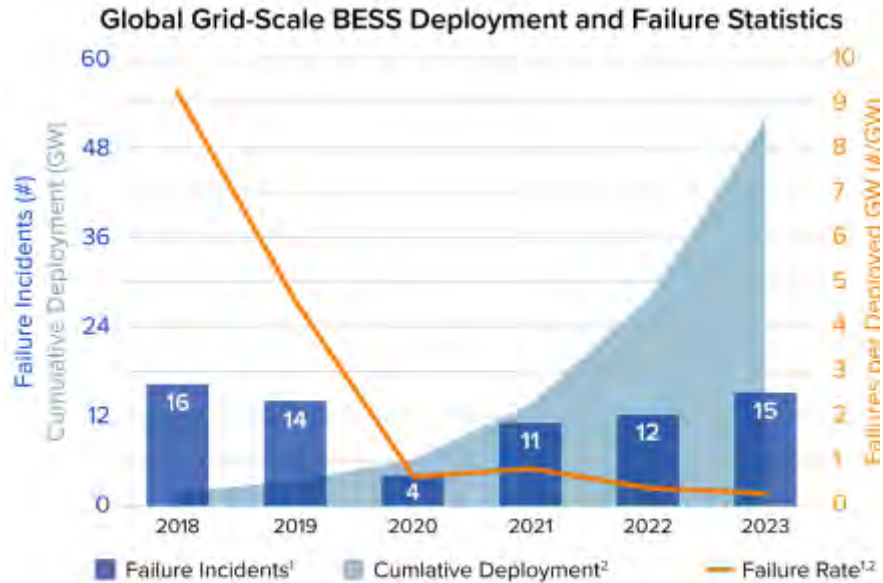
### **1. Hazardous material**

Typically where hazardous material presents an impact on adjoining or nearby property values is due to pollution, risk of spillage, or other impacts that could get into the soil, water table, or into the air. Examples include heavy industrial uses, coal burning uses, or even some heavy agricultural uses.

According to Ms. Judy McElroy, president of Fractal Energy out of Austin Texas, she has been studying battery storage systems since 2012. Since that time there have only been two fires related to this type of system across the United States and both of those fires were in Arizona. Both of those fires were in non-monitored systems that had warnings going off for a week prior to the fire and both were owned and operated by the same company. She indicated that the risk of fire is very limited and that they typically use a closet system as a failsafe to contain and control if a fire did occur. She indicated that any of the gases that would escape from such a fire would be similar to the chemicals that would be released if your kitchen garbage caught on fire and therefore no risk to the surrounding properties even in such an extreme situation.

A battery storage facility presents no potential hazardous waste byproduct as part of normal operation. According to Ms. McElroy, there is no risk to the soils, water supply, or air from the operation of a battery storage facility.

The EPRI Battery Energy Storage System Failure Incidence Database was initiated in 2021 as part of BESS safety research and tracks data back to 2018 globally. The following chart shows that while incident rates are relatively consistent across the time period, the actual failure rate has dropped precipitously on a failure per GW. So despite substantial growth of over 8 times the GW installed since 2020 to 2023, the failure rate is dropping.



Sources: (1) EPRI Failure Incident Database, (2) Wood Mackenzie. Data as of 12/31/23.

Based on that information I conclude that the proposed battery storage system does not have the characteristics of a hazardous material byproduct and no related external obsolescence on adjoining property value.

## 2. Odor

Odor is the next category that has the second highest potential impact on nearby property values. Odor is an impact often considered with waste water treatment facilities, solid waste facilities, manufacturing, and related uses. There is no significant odor related to a battery storage system and therefore no impact on adjoining or nearby properties related to odor.

## 3. Noise

Noise is the next category that has the next highest potential for impact on property values. Noise impacts are found near airports, railroads, heavy industry, or other significant generators of noise including outdoor music venues and the like.

I have reviewed three different noise studies by three different experts on this topic specific to BESS, which all support a finding of no impact on property value related to noise concerns.

The systems shown in the market data include a system adjoining a school, a church, and in close proximity to numerous homes including rural homes near park land. I conclude that the battery storage system is not a significant contributor to noise and therefore would not have a negative impact on adjoining property values.

## 4. Traffic

Traffic impacts come from traffic patterns related to a site that could cause queuing outside the property or putting too much new traffic within a confined area.

The battery storage system would be remotely monitored and other than occasional maintenance would not have a significant number of trips per day. In fact it would have fewer trips per day than

a single-family dwelling. I therefore conclude that traffic related to this use will not have a negative impact on adjoining property values.

## **5. Stigma**

There is no stigma associated with battery storage facilities.

Stigma is most often associated with adult establishments and would not typically be connected with infrastructure like this use.

## **6. Appearance**

Appearance or viewshed impacts are typically more for scenic areas where there could be premiums for a view, but also include negative impacts related to less aesthetic uses in proximity to housing. This is a category that could be considered for a battery storage facility.

However, the boxes will be 9 feet tall and will be screened by existing vegetation from the nearest homes. The distances to the nearest homes are further than what was identified in most of the other BESS examples, which substantially mitigates visual impacts even if there were not a landscaping screen.

Substations are much taller and harder to effectively screen, whereas the proposed battery storage use would be lower to the ground.

Given the similar use of screens for taller substations, I consider this a good mitigation method for the appearance of the subject property.

Whenever you consider the impact of a proposed project on viewshed or what the adjoining owners may see from their property it is important to distinguish whether or not they have a protected viewshed or not. Enhancements for scenic vistas are often measured when considering properties that adjoin preserved open space and parks. However, adjoining land with a preferred view today conveys no guarantee that the property will continue in the current use. Any consideration of the impact of the appearance requires consideration of the wide variety of other uses a property already has the right to be put to which could include significant agricultural structures.

## **VII. Conclusion**

The proposed use of the subject property is consistent with adjoining industrial and residential uses as shown by the similar projects. They also show compatibility with schools, churches, homes, and parks.

The paired sales in New York as well as the ones in Massachusetts, North Carolina, Illinois and Texas illustrate that the battery storage facilities had no impact on the nearby home sales prices at ranges of 180 to 600 feet. The closest home at the subject property will be 775 feet.

The breakdown of potential factors that cause a negative impact (or external obsolescence) on adjoining property value shows that the only area for consideration is the appearance, which is well addressed through the existing landscaping and setbacks. Landscaping was a mitigating factor used with many of the projects identified. The landscaping at the subject property including the grass-covered berm provide a similar to superior mitigating factor.

Based on those various considerations, I conclude that there is no reasonable basis to anticipate a negative impact on adjoining property value.



# Kirkland Appraisals, LLC

Richard C. Kirkland, Jr., MAI  
9408 Northfield Court  
Raleigh, North Carolina 27603  
Mobile (919) 414-8142  
[rkirkland2@gmail.com](mailto:rkirkland2@gmail.com)  
[www.kirklandappraisals.com](http://www.kirklandappraisals.com)

---

## **PROFESSIONAL EXPERIENCE**

<b>Kirkland Appraisals, LLC</b> , Raleigh, N.C. Commercial appraiser	2003 – Present
<b>Hester &amp; Company</b> , Raleigh, N.C. Commercial appraiser	1996 – 2003

---

## **PROFESSIONAL AFFILIATIONS**

<b>MAI</b> (Member, Appraisal Institute) designation #11796	2001
<b>NC State Certified General Appraiser</b> # A4359	1999
<b>VA State Certified General Appraiser</b> # 4001017291	
<b>SC State Certified General Appraiser</b> # 6209	
<b>KY State Certified General Appraiser</b> # 5522	
<b>TN State Certified General Appraiser</b> # 6240	
<b>FL State Certified General Appraiser</b> # RZ3950	
<b>GA State Certified General Appraiser</b> # 321885	
<b>MI State Certified General Appraiser</b> # 1201076620	
<b>PA State Certified General Appraiser</b> # GA004598	
<b>OH State Certified General Appraiser</b> # 2021008689	
<b>IN State Certified General Appraiser</b> # CG42100052	
<b>IL State Certified General Appraiser</b> # 553.002633	
<b>LA State Certified General Appraiser</b> # APR.05049-CGA	
<b>TX State Certified General Appraiser</b> # 1380528 G	
<b>ND State Certified General Appraiser</b> # CG-224129	
<b>OR State Certified General Appraiser</b> # C001665	

---

## **EDUCATION**

<b>Bachelor of Arts in English</b> , University of North Carolina, Chapel Hill	1993
--	------

---

## **CONTINUING EDUCATION**

Uniform Standards of Professional Appraisal Practice Update	2024
ASFMRA Integrated Approaches to Value (A360)	2024
ASFMRA Best in Business Ethics	2023
Appraising Natural Resources Series – Oil, Gas & Minerals	2023
Appraisal of Industrial and Flex Buildings	2023
Commercial Land Valuation	2023
Fair Housing, Bias and Discrimination	2023
Pennsylvania State Mandated Law for Appraisers	2023
What NOT to Do (NCDOT Course)	2023
The Income Approach – A Scope of Work Decision	2023
Valuation of Residential Solar	2022

Introduction to Commercial Appraisal Review	2022
Residential Property Measurement and ANSI	2022
Business Practices and Ethics	2022
Uniform Standards of Professional Appraisal Practice Update	2022
Sexual Harassment Prevention Training	2021
Appraisal of Land Subject to Ground Leases	2021
Michigan Appraisal Law	2020
Uniform Standards of Professional Appraisal Practice Update	2020
Uniform Appraisal Standards for Federal Land Acquisitions (Yellow Book)	2019
The Cost Approach	2019
Income Approach Case Studies for Commercial Appraisers	2018
Introduction to Expert Witness Testimony for Appraisers	2018
Appraising Small Apartment Properties	2018
Florida Appraisal Laws and Regulations	2018
Uniform Standards of Professional Appraisal Practice Update	2018
Appraisal of REO and Foreclosure Properties	2017
Appraisal of Self Storage Facilities	2017
Land and Site Valuation	2017
NCDOT Appraisal Principles and Procedures	2017
Uniform Standards of Professional Appraisal Practice Update	2016
Forecasting Revenue	2015
Wind Turbine Effect on Value	2015
Supervisor/Trainee Class	2015
Business Practices and Ethics	2014
Subdivision Valuation	2014
Uniform Standards of Professional Appraisal Practice Update	2014
Introduction to Vineyard and Winery Valuation	2013
Appraising Rural Residential Properties	2012
Uniform Standards of Professional Appraisal Practice Update	2012
Supervisors/Trainees	2011
Rates and Ratios: Making sense of GIMs, OARs, and DCFs	2011
Advanced Internet Search Strategies	2011
Analyzing Distressed Real Estate	2011
Uniform Standards of Professional Appraisal Practice Update	2011
Business Practices and Ethics	2011
Appraisal Curriculum Overview (2 Days – General)	2009
Appraisal Review - General	2009
Uniform Standards of Professional Appraisal Practice Update	2008
Subdivision Valuation: A Comprehensive Guide	2008
Office Building Valuation: A Contemporary Perspective	2008
Valuation of Detrimental Conditions in Real Estate	2007
The Appraisal of Small Subdivisions	2007
Uniform Standards of Professional Appraisal Practice Update	2006
Evaluating Commercial Construction	2005
Conservation Easements	2005
Uniform Standards of Professional Appraisal Practice Update	2004
Condemnation Appraising	2004
Land Valuation Adjustment Procedures	2004
Supporting Capitalization Rates	2004
Uniform Standards of Professional Appraisal Practice, C	2002
Wells and Septic Systems and Wastewater Irrigation Systems	2002
Appraisals 2002	2002
Analyzing Commercial Lease Clauses	2002
Conservation Easements	2000

Preparation for Litigation	2000
Appraisal of Nonconforming Uses	2000
Advanced Applications	2000
Highest and Best Use and Market Analysis	1999
Advanced Sales Comparison and Cost Approaches	1999
Advanced Income Capitalization	1998
Valuation of Detrimental Conditions in Real Estate	1999
Report Writing and Valuation Analysis	1999
Property Tax Values and Appeals	1997
Uniform Standards of Professional Appraisal Practice, A & B	1997
Basic Income Capitalization	1996