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To: Howell Township Planning Commission and Data Center Subcommittee
From: Paul Montagno, AICP, Principle and Brady Heath, Township Planner
Date: May 7, 2026
Re: Data Centers

The Resident Research Committee has done considerable research on data centers and other “high impact land uses” and provided recommendations to incorporate in the data center ordinance. We appreciate the work they have done and the input that has been provided for consideration by the Planning Commission as they develop a draft ordinance. At this point it will be important of the Planning Commission members on the subcommittee to provide feedback on the draft and any specific direction on updates they would like to see in the current draft.

We have incorporated many of the suggestions that have been provided. However, there are some suggestions that have not been incorporated for a number of reasons. For example, there may be other sections of the ordinance that address specific requirements, suggestions are covered in other township ordinances or documents, or regulations are not enabled by state law. This memo lists the items that were recommended and indicates where in the ordinance it was added, where it already exists in the ordinance or where it should be incorporated somewhere else, and why it wasn’t incorporated. Additionally, there are some suggestions that we have incorporated but would rely on the committee to review and discuss to determine if the regulation is appropriate for inclusion. Ultimately, we will need to vet the ordinance through legal council to ensure all requirements are defensible

In the attached draft dated 5/7/26, does not show track changes because the draft was becoming too cumbersome. You can generally tell what sections were suggested by the RRC by comparing the current draft to the edits that were previously provided.

We would like to use this memo as a guide for our next discussion in order address some of the outstanding suggestions. We encourage you to go through this memo and the draft ordinance and be prepared with specific feedback and direction at the next meeting.

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Additional Ordinance Sections to Incorporate

Application

1. A fee of X% of the total proposed development investment shall be remitted with application.

- **Not included in the ordinance.** The township has a general fee schedule that includes the fees for various permits and applications which is updated from time to time. It would be most appropriate to include fees for a “High Impact Land Use” in the fee schedule. **Be sure this is added to fee schedule list now so that it does not get missed later.**

2. The applicant shall not be permitted to request township officials to sign Non-Disclosure Agreements (NDAs) for the sake of accessing any and all information relevant to approving the project.

- **Not included in the ordinance.** This is not a zoning issue. This would be a township policy and could be adopted as a standalone policy resolution or could be incorporated in the Township Code of Ordinances. We defer to the township attorney on this issue. **Be sure to add in ordinance book elsewhere then - lets select spot now so it does not get missed later.**

3. Applicant shall notify all property owners within one thousand five hundred (1,500) feet of the proposed development of the Special Use Permit request.

- **Not included in the ordinance.** It is not typical for an applicant to do the public hearing notices. Per Section 16.05 of the ZO, the township is responsible for notices. Currently the requirement is for 300 feet. We can change the requirement for data centers to notify people within one thousand five hundred (1,500) feet, if the Planning Commission determines that the additional distance is appropriate. **From Ordinances - Chandler, AZ & Cass Co., MO**

4. Before any Public Hearings take place, the developer shall host no fewer than two (2) town hall meetings open to the public for the purpose of sharing information, questions, and answers about the project.

- **Needs to be discussed further.** We would like to discuss this further at the next subcommittee meeting.

5. All information which will be provided to the township for the purposes of the special use permit process shall be made available to the public at least seven (7) days prior to the first town hall event.

- **Not included in the ordinance.** Once an application is made to the township all information is considered public. The township Clerk should be consulted on how information is to be made available for public review. **From Ordinances - Chandler, AZ & Cass Co., MO**

6. Application shall clearly and explicitly name all owners and invested parties, including

Additional Sections to Incorporate
May 7, 2026

end-users. End-users must be the party apply for and signing agreements with the township.

- **Not included in the ordinance.** If the township determines that this is appropriate it should be required on the application. An end user for a development project is not always known or relevant. Any land use approvals by the Township or agreements with the Township would be binding on all successors.

Our own HT Ordinance Book requires the information and signature of the owner to accompany an applicants information on an application for a bill board if they are not the owner - section 19.13. Need to be able to fall back on parent company if developer goes under. Also from an ordinance in place in Chicago, IL

7. A complete, preliminary site plan for all phases of development shall be provided with application.

- **Added in the ordinance.** In section 16.2316.23.B.2.

8. Applicability section

- **Updated.** Section 16.23.B was updated to be clearer and more concise indicating that that the section applies to high impact uses and what permits and application are require. **Please see notes in CW revised draft below.**

9. Districts Permitted

- **Updated.** Section 16.23.C. was updated to be clearer and more concise, mimicking the language found in the Green Oak Ordinance, and the Township's renewable energy ordinance referencing the zoning map where the overlay district will be depicted if adopted. **Remove principal use from list of allowable uses as it is not the intent for high impact land uses to be a permitted principal use in any district. They should only be special use.**

10. Additional application requirements.

- **Added in the ordinance.** Additional application requirements specific to high impact uses were added to section 16.23.D. Some of the elements that were included in the RRC's recommendation were not included because they were already covered in Article 20, belonged in the fee schedule, or are part of the special use procedures already required in the ordinance. **Please see notes in CW revised draft below, discussion needed on omitted items.**

11. Utilities Impact Statement from all utility providers confirming capacity to serve, any required infrastructure upgrades, and a signed acknowledgement that any and all such upgrades shall be 100% paid for by the applicant.

- **Already in the ordinance.** In Section 16.23.G.1.

12. Statement from emergency services (Police, Fire, EMS, etc) describing their ability to respond to abilities, and what additional training and/or equipment would be required to do so; a signed acknowledgement from the applicant that they will fund 100% of the cost of providing said training and equipment.

- **Not included in the ordinance.** The Fire Department, the Livingston County Road

Additional Sections to Incorporate
May 7, 2026

Commission, and the Township Engineer perform their own reviews, and will cite their concerns in the review.

This is still included in the CW revised draft. The intent is to be clear & upfront with a proposed HILU development that any additional staffing and equipment needs of emergency agencies are to be the developers financial responsibility not the county's or taxpayers. From ordinances - Henrietts, MI, Cass Co., MO & DeKalb, GA

13. Stormwater Management Plan demonstrating their commitment to minimizing runoff to the greatest extent possibly by adhering to the Drain Commissioner's recommendations and requirements.

- **Not included in the ordinance.** The Township Engineer reviews the plans and will cite any concerns with stormwater along with the Drain Commissioner. This is required for site plan reviews in Section 20.08.D.

This was recommended language from the Livingston County Drain Commissioner.

14. Cooling system specs.

- **Included.** This section may need further discussion.

15. An escrow shall be funded with \$X at all times through occupancy.

- **Not included in the ordinance.** This can be included in the fee schedule.

Please see note in below CW revised draft.

16. List of regulated substances, including cooling solutions.

- **Included.** In Section 16.23.D.1.s

17. Signed acknowledgement from the developer and end user of our public notification and involvement process and our High Impact Land Use Overlay District and Data Center Ordinances.

- **Not included.** If a development agreement is required, this can be incorporated there.

If the public notification and involvement process is included, then this should be ok to omit, we just wanted to be sure the developer was aware it was in there - it was intended as an extra layer of legal protection for the township.

18. Signed acknowledgement from applicant and end user that the facility will not be considered for IFT Abatements.

- **Not included.** This would be a township board policy decision, not a zoning ordinance regulation.

This needs to be set as a policy now, so it is not overlooked later.

19. Construction lighting photometric diagram.

- **Added in the ordinance.** Added in Section 16.23.G.8.A.

Site Design

1. Siting Requirements

Cryptocurrency Mining Facility: Shall require a Special Use Permit in the High Impact Land Use overlay area only and shall not abut sensitive receptor

Additional Sections to Incorporate
May 7, 2026

parcels, nor shall the property lines for the subject parcel be located within nine hundred (900) feet of any sensitive receptor parcel property lines. No more than two (2) Cryptocurrency Mining Facilities shall be permitted in the township.

Minor Data Center: Shall require a Special Use Permit in the High Impact Land Use overlay area only and shall not abut sensitive receptor parcels, nor shall the property lines for the subject parcel be located within nine hundred (900) feet of any sensitive receptor parcel property lines. If a Minor Data Center requires a substation and/or water treatment plant, it shall be classified as a Medium Data Center and subject to those applicable siting standards. No more than two (2) Minor Data Centers shall be permitted in the township.

Medium Data Center: Shall require a Special Use Permit in the High Impact Land Use overlay and shall not abut sensitive receptor parcels nor shall the property lines for the subject parcel be located within nine hundred (900) feet of any sensitive receptor parcel property lines. No more than two (2) Minor Data Centers shall be permitted in the township. No more than one (1) Medium Data Center shall be permitted in the township.

Major Data Center: Shall require a Special Use Permit in the High Impact Land Use overlay and shall not abut sensitive receptor parcels nor shall the property lines for the subject parcel be located within one thousand two hundred (1,200) feet of any sensitive receptor parcel property lines. No more than one (1) Major Data Center shall be permitted in the township.

Data Center Campus: Shall require a Special Use Permit in the High Impact Land Use overlay and shall not abut sensitive receptor parcels nor shall the property lines for the subject parcel be located within one thousand four hundred (1,400) feet of any sensitive receptor parcel property lines. No more than one (1) Data Center Campus shall be permitted in the township.

- **Not added in the Ordinance.** It is mentioned in the table above and all data centers except for Ancillary have to go through a special land use as they are Permitted Principal Special Uses with Conditions. Additionally, the prohibition of abutting a sensitive receptor doesn't make sense when there are already substantial setback requirements. Why limit the number if they meet the regulations that are designed to protect the public interest.

What are the reasons to allow unlimited data centers/crypto? They can be limited per MZEA 125.3201, Sec. 201.(4), currently utilized by: City of Morrice, MI, Grass Lake, MI, Ann Arbor, MI, Arlington Twp., MI, Fabius Twp., MI for various other uses: short term rentals, marijuana facilities/permits, adult entertainment establishments, tiny homes.

2. Unlike standard dB(A) measurements, which primarily detect mid-range sounds like speech and traffic, dB(C) measurements capture deeper, low-frequency noises such as infrasound from heavy machinery. These sounds can travel farther and penetrate walls, making them more disruptive in residential areas even when the source of the noise is in a non-residential district. Adding dB(C) limits ensures that noise enforcement addresses all types of sound, improving fairness and effectiveness in line with the intent of this ordinance. Because research on the harms of low frequency and infrasound references unweighted decibels, including dB(Z) limits ensures that noise enforcement aligns with the intent of the ordinance and protects the community from potential health impacts in addition to nuisance.

Additional Sections to Incorporate
May 7, 2026

- **Not Added in the ordinance.** This feels informative rather than a requirement of Zoning.

This is from a Fort Lauderdale, FL ordinance, and per a legal recommendation that including legislative findings in ordinances strengthens the township's case in court and provides clarification for court considerations down the road should they occur.

3. Parking: Data center parking regulations must be established in Article 18 and added to the chart; or is PC comfortable using a similar use as the guidelines?

- **Added in the ordinance.** Added in Section 16.23.E.2.
- **Requires further discussion.** Does the subcommittee want to add parking requirements for data centers in Section 18.02, or add it to 21 in Section 18.02 Manufacturing, Fabricating, Processing and Bottling Plants, Research and Testing Laboratories, or other related, permitted Industrial Uses. Which requires One (1) space for each employee working during the largest working shift or one (1) space for every 550 square feet of total floor space, whichever is greater. **This should be done now so it is not missed later.**

4. Because of the potential for high impact land uses such as data centers and cryptocurrency mining facilities to consume a disproportionately large amount of water and power in the community, and because the primary source of water consumption at data centers and cryptocurrency mining facilities are related to cooling systems, in order to align with the intent of this ordinance, to protect and ensure the efficient consumption and use of public utilities and natural resources, any system designed for cooling of the facility and/or equipment shall not negatively impact the surrounding region by conforming to the following requirements:

- **Not Added in the ordinance.** This feels more informational rather than a zoning requirement. This is generally covered in the intent section.
See note above about including legislative findings in ordinances.

5. Substations shall be located as far from property lines as possible, ideally situated behind buildings to provide a visual buffer from road frontage and the nearest residential parcel.

- **Added in the ordinance.** Added in Section 16.23.E.6.e.iv.

6. Detention/Retention ponds are not allowed except as part of the Drain Commission's stormwater management plan.

- **Added in the ordinance.** Added to section 16.23.F.11

7. Walls (height, material, etc) and other noise mitigating features may be allowed for the purpose of adhering to noise ordinances, even if they do not comply with the ordinance requirement.

- **Added in the ordinance.** But this must be reconciled with Section 14.14 states that mechanical equipment is not included in the height. Data centers can be 50 feet in height, but mechanical equipment is not included in the 50 feet.

8. Fencing requirements (barbed wire? Chain link?).
 - **Already in the ordinance.** In Section 16.23. H.1.A. There are standards on fencing and walls in Sections 14.26 and 28.08. This section has been modified to reflect Sections 14.26 and 28.08 with the 8-foot-tall requirement.

9. **Drain Tile inspection requirements.**

- **Not added in ordinance.** This is required for all projects by the Livingston County Building Department.
Per Liv Co PC feedback on Green Oak's High Resource Demand Facility ordinance - including references to other regulatory body requirements is preferred rather than not addressing them at all.

Utilities/Power

1. All utility and electrical transmission lines shall be located underground.

- **Added in the Ordinance.** Added in Section 16.2316.23.E.5.a.

2. **Power use shall be capped according to the following:**

- a. **Minor Data Centers:**
- b. **Medium Data Centers:**
- c. **Major Data Centers:**
- d. **Campus Data Centers:**
- e. **Township Data Center Total:**

- **Not added in ordinance.** The Township does not have the authority to regulate this. However, we can require power use reporting which is required in Section 16.23.7.a.1. **Discussion needed: Included because requested by PC member: Example found in proposed ordinance from Kochville, MI limits power consumption by size tier but does not have upper tier cap. Related to other land use issues i.e. eminent domain.**

3. **No onsite power generation shall be permitted other than renewables permitted per section F.2.**

- **Not added in ordinance and needs further discussion.** Not sure if we can require this.

The concern for not including this would be then allowing turbines, generators, portable nuclear to be used to supplement main power supply and these not having regulatory oversight by the township - example - portable nuclear being close to residential homes there should be a set distance, we need to know what a safe distance would be. Example to look at is Memphis, TN and continuing use of turbines and just paying fines.

4. **Fuel Storage limits? Requirements?**

- **Added in the ordinance.** Added in Section 16.23.F.4.d.
From RRC suggestions in section G.1.e. under sustainability and energy use requirements, there was a note that if requiring natural gas generators with connection to natural gas lines by utility provider then onsite storage is not needed so should this be added? Are we requiring natural gas generators/hooks ups or no?

Construction

1. **Applicant shall have a community complaint resolution liaison available 24 hours a day beginning with construction. The contact information shall be posted in a visible location from the road frontage, as well as provided to the township to be published on the website.**

Additional Sections to Incorporate
May 7, 2026

- **Added in the ordinance.** Added in new Section 16.23.I.1 – Construction standards. **Discussion needed: 2 items not added: preventing 24hr construction & requiring approval for any extensions of work hrs by the PC at open meetings & only on a temporary basis - good for 30 days at a time only. Look at Port Washington, WI as example of resident impact issues with allowing unregulated construction work hours.**

2. All complaints shall be responded to within 24 hours, and if not completely resolved then a resolution plan shall be provided to the township and complainant.

- **Added in the ordinance.** Added in Section 16.23.I.2.

3. Applicant shall provide a construction lighting photometric diagram showing predicted, maintained lighting levels produced by the proposed lighting fixtures. Maximum maintained vertical footcandle at any adjoining property lines shall be 0.5 footcandles, measured three feet above ground.

- **Added in the ordinance.** Added in Section 16.23.H.8.a.i.

While dark sky principals being required to be met were included in section 16.23.H.8.a.i. that is different than the item listed above - which specifically pertains to lighting regulations during the construction phase, consideration for construction lighting regulations needs to be addressed i.e. night work

4. Construction shall adhere to the hours in the Ordinance Book; absolutely no variance will be allowed.

- **Added in the ordinance.** Added in Section 16.23.I.3.

What was added is just a note that says construction is subject to hours in current ordinance - current ordinance language pertaining to this is under noise restrictions in section 14 and reads "Construction activity between the hours of 7am and sunset, Mon - Fri and between the hours of 10am and 6 pm on Sunday.... are an exception to noise requirements" This might be ok for normal construction sites but not for DC's as their construction period can potentially go on for 5-10 years depending on size. We asked for work (not just noise) to be limited to 7am to 6pm Mon-fri, with the requirement that weekend work and additional work is capped at starting at 6am or extending to 10pm and having to be approved on a temporary case by case basis by the PC at meeting open to public comment good for only 30 days at a time.

Maintenance

1. Applicant shall submit documentation of seasonal HVAC maintenance for any facility cooling systems to ensure quiet equipment operation.

- **Added in Ordinance.** Added in Section 16.23.F.3.c.i.

Monitoring

1. Jobs report

Added

It was actually added under G

- ~~**Already in the ordinance.**~~ Section 16.23.F.7.vii.

Compliance is a large section with many requirements to ensure monitoring and compliance of an operational high impact land use. There will need to be a section covering this to ensure we are getting appropriate tax dollars, ensure noise regulations, ensure water and electricity consumption, proof of annual insurance coverages, among many other things - from ordinances in place in Henrietta, MI and Green Oak, MI. Can be worded simple like Henrietta but thorough list is needed so staff know what to be looking for. Note also need permit for photos for Brent to be able to assess IT equipment upgrades and valuation.

2. Compliance.

- **Not added in Ordinance.** This needs further discussion.

3. Revocation of Special Use Permit. If at any time the data center operation exceeds the standards as set forth in this section, the special use permit shall be revoked, and operations shall cease.

- **Added in the ordinance.** Added in Section 16.23.B.d.

This was not actually found to be added anywhere, needs to be done now so that it is not missed later.

4. Confirmation from FAA about airspace compliance.

- **Requires further discussion.** We would like to discuss this further at the next

Additional Sections to Incorporate
May 7, 2026

subcommittee meeting.

5. **Mandatory Performance Guarantee (ie Section 20.15).**

Actually added to J.3

- **Added in the ordinance.** Added in Section 16.23.B.c.i.

Performance guarantee is meant to ensure compliance. Not the same as a decommissioning bond (which is the only one added) and is meant to cover the cost of decommissioning, they are separate and both are needed.

6. **Penalties for violations scaled for large corporations; revocation of SUP for multiple violations of the same nature?**

- **Not added in the ordinance/requires further discussion.** We would like to discuss this further at the next subcommittee meeting.

7. **Post construction, pre-occupancy documentation of compliance with noise, PUE/TUE/WUE**

Actually added to G.7.a

- **Added in the ordinance.** Added in Section 16.23.7.a.v.

Pre and post occupancy documentation of compliance was not found, only found requirement added for reporting on these items once operational under section G.7.a.

We look forward to discussing this further with you all at our next subcommittee meeting. Please let us know if you have any comments or questions in the meantime.

Sincerely,



CARLISLE/WORTMAN ASSOC., INC.
Paul Montagno, AICP
Principal



CARLISLE/WORTMAN ASSOC., INC.
Brady Heath
Community Planner

Draft High Impact Land Use Overlay District

Definitions proposed to be added to Section 2.02.

1/3 Octave Band Analysis: A frequency spectrum analysis where the unweighted sound levels of all frequencies in a sound sample are split into sections (octave bands) where the upper limit is twice the frequency of the lower limit, and each octave band is further split into three equal sections providing a more detailed analysis of the intensity and frequency composition of a sound.

Air Chiller: a cooling and heat rejection system which utilizes fans to move ambient air over condenser coils to cool the water or refrigerant in a Closed Loop Cooling System.

Battery Energy Storage Systems (BESS): A storage system that collects energy from renewable and non-renewable sources in rechargeable batteries for later use.

Closed Loop Cooling System: Any cooling system that constantly reuses and recycles an initial load of process fluid (water or chemical substance) within its operating components for cooling purposes, which is not directly exposed to the air or other cooling system components during heat rejection; this process fluid still requires periodic discharge and refill.

Cooling Tower: an industrial-scale heat exchanger that removes heat from the cooling process fluid.

Open-Circuit Cooling Tower/Open Loop Cooling System: a heat rejection system where the warm process water is sprayed directly onto fill media, where it is then exposed to airflow to utilize evaporative cooling; these systems require frequent discharge and refill, consuming large amounts of water, due to the contamination of the process water during the heat-rejection phase.

Closed-Circuit Cooling Tower: utilized in some Closed-Loop Cooling Systems; basin water is sprayed over the closed-loop coils to utilize evaporative cooling. Basin water requires periodic discharge and refill.

Mechanical Draft: Open or Closed Circuit Cooling Towers may use Mechanical Draft, which uses fans to move air through the water to enhance the cooling process by accelerating evaporation and therefore heat transfer.

Computer Room Air Conditioners (CRAC): A type of Room-Level HVAC system utilized in computer server rooms/data centers to remove high-density heat generated by IT equipment; CRACs pull hot air from the entire room, and return cool air to the entire room, rather than cooling the IT equipment directly; utilizing refrigerant-based cooling.

Commonly referred to as Computer Room Air Handlers when circulating chilled water instead of refrigerant.

Cryptocurrency Mining Facility: A facility of any size that is dedicated to operating data processing equipment for cryptocurrency mining and the process by which cryptocurrency transactions are verified and added to digital ledgers. This includes data mining facilities.

Data Processing. The collection and manipulation of digital data to analyze and produce meaningful information.

Data Center: A physical facility housing the people, hardware and software organized to provide information processing services. This includes data processing facilities, server farms and artificial intelligence / “AI” data centers. Data centers are further defined by the following:

See definition of a Data Center, also Ancillary Data Center are

- 1) **Ancillary Data Center:** ~~A~~ data centers that ^{are} ~~is~~ ancillary to another primary use and a) occupy no more than ten percent of the building’s footprint, b) are used to serve the enterprise functions of the on-site business and are not used to lease data storage and processing services to third parties, and c) are not housed in a separate, stand-alone structure on the parcel.

See definition of a Data Center, also Minor Data Centers shall be

- 2) **Minor Data Center:** ~~A Data Center that is~~ under 10,000 total square feet (for all buildings and structures on the site). If a minor data center requires an electrical substation and/or water treatment plant, it shall be classified as a Medium Data Center.

See definition of a Data Center, also Medium Data Centers shall be

- 3) **Medium Data Center:** ~~A Data Center that is~~ between 10,000 square feet and 99,999 total square feet (for all buildings and structures on the site).

See definition of a Data Center, Also Major Data Centers shall be

- 4) **Major Data Center:** ~~A Data Center that is~~ between 100,000 square feet and 499,999 total square feet (for all buildings and structures on the site).

See definition of Data Center, also

- 5) **Data Center Campus:** A Data Center Campus shall consist of more than one Data Center building and may be any combination of sizes of Data Center buildings, not to exceed a total of 750,000 total square feet (for all buildings and structures on the site).

Decibel, dB: A decibel (dB) is a common measure of sound intensity that is one-tenth of a bel (B) on the logarithmic intensity scale.

Decibel-dBA: Decibels measured in dBA are weighted to the frequencies in the middle of the range of human hearing, as a representation of the perceived overall loudness.

Decibel-dBC: Decibels measured in dBC are weighted to the low-frequency, sounds which travel and penetrate farther than treble sound, often a component of tonal noise.

Decibel-dBZ: Decibels measured in dBZ are weighted to measure without frequency-based adjustments, for situations requiring a precise measurement of the sound's total energy and frequency content.

Direct Liquid Server Cooling: Server cooling technologies in which liquid coolant directly removes heat from electronic components through immersion or cold-plate contact, rather than through room air circulation.

Direct-to-Chip Cooling: A method of liquid cooling that utilizes coolant to dissipate heat directly from computer processing chips and greatly reduces electrical power and water consumption.

Dry Cooler: a heat rejection system which utilizes fans to move ambient air over a cooling coil; commonly used in closed-loop cooling systems.

Electrical Substation: An electric system facility that converts higher voltages to lower voltages within or separate from a ~~data center~~ to generate sufficient power at maximum efficiency; can operate independently for dedicated sites once directly connected to the transmission line.

Equipment Cooling: Cooling for equipment, including but not limited to machinery, computer component cooling, processor cooling, server cooling, rack cooling, generator cooling, electrical component cooling.

Facility Cooling: Cooling for the facility/structure itself, not for equipment, machinery or components located therein and/or on the property. This includes HVAC cooling.

Generator: A machine that converts one form of energy into another.

High Impact Land Use: A term that refers to a) an industry or business with higher than average consumption/use of resources, typically of electricity and/or water, and/or b) an industry or business with operations that are highly impactful from the standpoint of noise, vibration, type of ^{potentially} power used such as battery storage systems, nuclear, etc., utilization of private power substations or switch stations, onsite fuel storage and potential negative impacts ^{health} on water and air quality. This includes data centers, data processing facilities, server farms, "AI" artificial intelligence, cryptocurrency mining facilities, and digital currency mining.

Hydrogen Fuel Cell: An electrochemical device that combines hydrogen and oxygen to produce electricity.

Infrasound: A low frequency sound below a frequency of 20Hz that is typically sub-audible to humans and often perceived as vibrations.

Liquid Immersion Cooling: A method of liquid cooling that utilizes submerging equipment in fluid. *that does not utilize large volumes of water and greatly reduces electrical power consumption, and offers an option for use of plant based biodegradable non-flammable oil.*

Megawatt: A unit of power output equal to 1,000,000 watts or 1,000 kilowatts, used to measure power consumption.

Octave Band: A method of splitting the frequency spectrum into sections where the upper limit is twice the frequency of the lower limit, identified by the center frequency.

Power Usage Effectiveness (PUE): a ratio that describes how ^{facility, including} a data center ^{is} uses energy; specifically, how much is used by the IT equipment compared to total power consumption. Calculated by dividing total facility energy by IT equipment energy.

Renewable “Green” Hydrogen: Renewable or “Green” Hydrogen is used for Hydrogen Fuel Cells and is sourced from water, using sustainable electricity sources such as solar or wind.

Sensitive Receptors: Schools, preschools, daycares, health facilities such as hospitals, long-term care facilities, retirement and nursing homes, community centers, places of worship, playgrounds, parks, campgrounds, prisons, dormitories, hotels, motels, and any parcels zoned agricultural residential, single-family residential and multi-family residential.

Standalone Modular Data Center / Cryptocurrency Mining Facility: Pre-engineered, prefabricated, temporary and standardized buildings, including shipping containers, designed to house computer servers and network equipment.

Tonal Noise: A noise characterized by a distinct, recognizable frequency, which stands out significantly against the background broadband noise, considered a nuisance due to the human auditory system’s sensitivity to pure tones, especially when they are continuous.

Total Power-Usage Effectiveness (TUE): A metric similar to PUE but which includes IT power such as server fans and internal power distribution losses with infrastructure overhead, to provide a better metric of energy efficiency across the entire data center development. Calculated by dividing the total facility power usage by the compute power usage.

Water Usage Effectiveness (WUE): a metric that measures how efficiently data centers use water by comparing the total water used to the power used by its IT equipment. Calculated by dividing annual water usage (liters) by IT equipment energy usage (kilowatts).

Amending Articles 4-13 to allow data centers as Permitted Accessory Uses or Permitted Principal Special Uses with Conditions.

Should only list articles, 5 and 8-13 - this does not apply to articles 4, 6 or 7, those are residential articles, this could be creating a legal loophole, at the very least its contradictory.

Ancillary data centers will be allowed as Permitted Accessory Uses in the following districts:

- Article 5– RT Research & Technology– Section 5.04
- Article 8– OS Office Service District– Section 8.04
- Article 9– NSC Neighborhood Service Commercial District– Section 9.04
- Article 10– RSC Regional Service Commercial District– Section 10.04
- Article 11– HSC Highway Service Commercial District– Section 11.04
- Article 12– IF Industrial Flex Zone– Section 12.04
- Article 13– I Industrial District– Section 13.04

Minor data centers will be allowed as Permitted Principal Special Uses with Conditions, subjected to the standards of Section 16.23, in the following districts if also located within the High Impact Land Use Overlay District:

- ~~Article 12 – IF Industrial Flex Zone – Section 12.03~~ Per PC member suggestion that was agreed upon high impact land uses such as data centers of any size should not be allowed in Industrial Flex zoning.
- Article 13 – I Industrial District – Section 13.03

Medium data centers will be allowed as Permitted Principal Special Uses with Conditions, subjected to the standards of Section 16.23, in the following district if also located within the High Impact Land Use Overlay District :

- Article 13 – I Industrial District – Section 13.03

Major data centers will be allowed as Permitted Principal Special Uses with Conditions, subjected to the standards of Section 16.23, in the following district if also located within the High Impact Land Use Overlay District:

- Article 13 – I Industrial District – Section 13.03

Campus style data centers will be allowed as Permitted Principal Special Uses with Conditions, subjected to the standards of Section 16.23, in the following district if also located within the High Impact Land Use Overlay District:

- Article 13 – I Industrial District – Section 13.03

Adding New Section 16.23: High Impact Land Use Overlay District

A. Purpose and Intent

The purpose of this ordinance is to establish a clear and thoughtful regulatory framework that addresses the unique characteristics of high impact land uses for the suitable zoning, siting, design, construction, operation, compliance and decommissioning of high impact land uses including but not

limited to data centers and cryptocurrency mining facilities. These regulations are intended to guide the placement and design of high impact land uses to balance stable local economic growth with the protection of **community health**, safety, welfare, natural resources, and the area's rural character. The intent of this ordinance is to permit only uses having performance characteristics which emit a minimum of noise, vibration, smoke dust, dirt, glare, toxic materials, offensive odors, gases, electromagnetic radiation or any other physically adverse effects to the extent that they are abnormally discernible or potentially harmful beyond the lot lines of the parcel or site upon which the use activity is located. This is achieved by:

1. Directing high impact land uses to areas where industrial uses are currently permitted ~~or planned~~ and that would have minimal impact on residents and surrounding properties with the use of a clearly designated high impact land use overlay district located **over the existing designated industrial zone.**
2. Minimizing, avoiding, and mitigating impacts such as noise, vibration, light/glare, air pollution and emissions, and water pollution through requiring the use of minimally impactful machinery, equipment, and systems.
3. Ensuring the efficient consumption and use of public utilities, such as water and electricity, prioritizing ~~renewable energy and conservation.~~ **cooling systems and facility designs that enable facilities to meet strict usage effectiveness metrics.**
4. Promoting context-appropriate architectural design and effective visual screening to ensure a visually cohesive design and compatibility with the surrounding land uses and the desired rural character of the area.
5. Establishing clear expectations and a predictable review process for developers to encourage efficient and well-planned designs, while retaining local control over development.
6. Ensuring compatibility with adjacent land uses and the Township's Master Plan.
7. Ensuring compliance with responsible regulations **for operation**, compliance, decommissioning and site restoration. **construction,**

B. Applicability

1. This section shall apply to high impact land uses including all types of data centers Ancillary, Minor, Medium, Major, and Data Center Campuses, and cryptocurrency mining facilities.
2. A complete preliminary site plan for all phases of the development that meets the requirements in **Article XX** shall be included ~~in~~ ^{with} the application. **along with any applicable fees.**
What article # is this supposed to be?
3. **All developments subject to this section shall require an application of a special land use subject to the requirements of Article 16.**

This should be a task item to verify it is there or added now to prevent it from being missed later

4. Approval is contingent upon the applicant demonstrating conformance to the requirements of this section, any other provisions of the Zoning Ordinance, and all other applicable Township Ordinances.

5. The applicant must enter in a development agreement with the Township.

6. All developments subject to this section shall be required to have a performance guarantee as outlined in Section 20.15. **Discussion needed, if intended to finish a backed out of project then no, because decommissioning would apply.**

7. The township board shall establish a fee for all high impact land uses applications to be added to the fee schedule.

8. Where silent within this provision, other applicable provisions apply (e.g., lighting, landscaping, stormwater, and performance standards).

C. Districts Permitted **From CW drafted language for Green Oak Data Center Overlay Ordinance**

High impact land uses including data centers and cryptocurrency mining facilities shall only be developed in districts where permitted as an Accessory Use, Principle Use or Principal Special Uses with Conditions if the property is located within the High Impact Land Use Overlay District on the Township's Official Zoning Map.

D. Application Requirements

RRC item E.1 was removed - requiring an applicant to prove demonstrated need, this came from City of Morrice, MI Ordinance

1. In addition to the required information for a site plan in Article XX and Applicant shall provide the following impact studies to accompany any application:

a. Projected power use. **Requirement of escrow and application fee removed, please note if it is the desire to not specify, then they should at least be listed.**

b. Projected water use. **From Ordinance - Morrice, MI**

c. Projected natural gas use.

d. Plans for any onsite power generation.

e. Projected PUE, TUE and WUE with supporting documentation.

f. Serviceability statements fully disclosing whether any utility needed has current capacity to service the needs of the facility at time of full commissioning, and if not: a plan for what is needed with a signed infrastructure development agreement verifying all costs for needed upgrades will be the developer or operator's responsibility.

g. Serviceability statements from local emergency providers, fire, EMS and police fully disclosing their ability to provide services for all phases of construction and upon full commissioning, and if not: a plan for what is needed with a signed development agreement verifying that all costs for needed upgrades, staffing, training and equipment will be the owning parent company's responsibility.

h. Projected noise levels (dBA, dBC and dBZ), vibration levels, noise mitigation features/plan and noise monitoring plans for the facility based on being fully operational and for the construction period.

i. Emergency and disaster plan for all phases, including construction.

j. Decommissioning and site restoration plan.

k. Traffic study for all phases, including construction.

l. Public facility, utility, and service impact assessment conducted by a licensed professional engineer chosen by the township.

m. All exterior building elevations for each structure.

n. Mechanical plans for the overall site.

o. Rooftop mechanical and electrical plans.

RRC Item E.8 was removed, requiring owner/operators to agree to not seek additional tax abatements through the township, if removed due to needing to be passed by resolution, lets make a task item for it and get it done so it is not missed later. If not, while we understand it is not the intent of this board/staff to approve additional tax abatements there should be limitations in place for future boards/staff so these abatements can only be offered to industries that provide a large number of on site jobs which is the intent of their existence.

Items suggested by RRC that were removed and need discussion:

Economic impact analysis

Environmental impact analysis

Market feasibility analysis - Optional per our current ordinance but should be mandatory for this use

Job creation report

Site plans requiring scale & direction

Site plans requiring all structures, surfaces, retention/detention ponds, set backs, entrances and exits be shown

Civil Engineering Drawing requiring site grading and drainage plan with drain commissioner approval

Jim's suggestion: Strategic Plan

- p. Electrical plan for the overall site including underground lines.
- q. Preliminary project timeline with estimated durations for each stage of work, including site prep, and detailed schedule for any pile driving.
- r. Equipment cooling system specifications.
- s. List of regulated substances, including any cooling solutions.
- t. Site lighting plan, including lighting plan for during the construction phase.

u.

E. Dimensional Standards and Siting Requirements

Table X below outlines the dimensional regulations and siting Requirements for data centers and cryptocurrency mining facilities within the High Impact Land Use Overlay District. Where the regulations in table X are different from the requirements in Section 3.17 the more stringent requirements shall apply.

Table X - Dimensional Regulations and Siting Requirements for within the High Impact Land Uses

Facility Type	Allowable Facility Size Ranges in Square Feet	Required Distance in Feet from Residential and Sensitive Receptor Parcels	Total Allowable Number of Facilities by Type within the Township
Ancillary Data Center	Not to exceed 10% of the associated Principal Use's building footprint	-	-
Cryptocurrency Mining	Not to Exceed 5,000	Greater than 900 feet **	2
Minor Data Center	Not to Exceed 10,000	Greater than 900 feet **	2
Medium Data Center	Within 10,000 – 99,999	Greater than 900 feet **	1
Major Data Center	Within 100,000 – 499,999	Greater than 1,200 feet **	1

Data Center Campus	Not to Exceed 750,000	Greater than 1,400 feet**	1
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** And if less than ten (10) residentially zoned parcels and/or sensitive receptor parcels are located within the distances outlined above. Missing below the above table is the written paragraphs for siting, per each size bracket, they stated that each type shall require a special use permit, shall not be allowed within each set distance from residential and/or sensitive receptor parcels and provided the total count for each by type allowed in the entire township - example: "No more than one (1) data center campus shall be permitted in the township." 5 siting paragraphs were not included in this draft

F. Site, Design and Use Standards

1. Screening and Landscaping Requirements.

- a. All ground level equipment (including HVAC, generators, transformers, and cooling towers) shall be fully screened by masonry walls, architectural panels, or landscaped berms that contain staggered rows of evergreen landscaping material so that said screening shall achieve 100% opacity and exceed the vertical height of the equipment being screened by at least six (6) inches within two (2) years of planting.
- b. All rooftop mechanical equipment shall be fully screened behind parapet walls, which shall not exceed the maximum building height restriction.
- c. A minimum 25-foot greenbelt shall be provided along all property lines.

d. Landscaping requirements are subjected to Section 28.03.A.

CW original "A minimum 25 foot greenbelt shall be provided along all property lines" was omitted

2. Parking requirements

- a. Parking requirements shall follow the standards of Section 18.02 for Data Centers.
- b. Employee and visitor parking lots shall be set back at least fifty (50) feet from all property lines.

3. Noise, Sound and Vibration Requirements

- a. Sound levels shall not exceed 55 dBA, 55dBC and 70dBZ at any high impact land use parcel. Generators shall not exceed 65 dBA, 55dBC and 70dBZ at the high impact land use parcel property line. All octave bands and frequencies 200 hertz (Hz) and below shall not exceed 60dBZ at any time.
- b. In the event pre-construction sound studies document pre-existing sound levels for A, C, and Z weightings that exceed the limits in this ordinance, then the pre-existing sound levels shall not be exceeded or amplified.

Consider omitting background noise can be removed from studies to isolate noise produced by DC
 c. Vibration shall not exceed limits outlined in Section 14.45.G of the Township Ordinance.

d. Noise and vibration limits apply to all equipment on site including but not limited to hvac systems, equipment cooling systems, mechanical yards, substations, chillers, renewable energy systems, and generators, any of which may need to utilize sound-dampening enclosures, modifications and/or isolation pads to mitigate noise and vibration.

i. Applicant shall submit documentation of seasonal HVAC maintenance for any facility cooling systems to ensure quiet equipment operation.

Not added was RRC item f. "the township reserves the right to amend, implement and enforce any additional noise and vibrations regulations applicable to all existing or new high impact land uses.

e. Noise/Sound Studies: A noise attenuation, or sound modeling study shall demonstrate compliance with maximum sound levels and must be submitted prior to the approval of a final site plan. This study must be specific to the proposed site topography, layout, and building type, scale, height, and construction proposed. This study must show noise conditions at the site prior to the project development must provide model-predicted noise conditions resulting from the proposed project post-development to demonstrate anticipated compliance with the noise ordinance.

"...development, at set locations determined by the Township, and must provide..."

Underlined verbiage was omitted

i. The sound study must be prepared by a professional sound/acoustical engineer chosen by the Township and be licensed in accordance with ISO 9613 standards.

ii. All sound studies shall include measurements and reporting for dBA, dBC and dBZ wavelengths, and shall include a full, unweighted one-third (1/3) octave band frequency spectrum analysis.

iii. Sound modeling studies must include recommendations for sound mitigation measures, if they are necessary for the use/facility to comply with sound level requirements. These mitigation measures, if applicable, must be reflected on the site plan and incorporated into conditions of the site plan approval. If mitigation measures are building related, they must be included in the building plans, and if they are landscaping related, they must be included in the landscaping plan prior to issuance of the Special Use permit(s).

iv. Sound study/routine sound surveillance schedule and additional requirements: a sound study must be submitted to the Township within 60 days of issuance of a certificate of occupancy for each phase of development and upon the facility becoming fully operational. Additional sound studies may be required at the time modifications of any kind are made, at the discretion of the Township.

Discussion: Jim's suggestion- once monthly, for first year- to document reasonable variances, for future comparison in the event of complaints

v. All sound studies must be conducted at a time known for peak facility, use, and cooling system operations. In the event the study shows that

the facility or use exceeds maximum allowable levels, the operator must immediately undertake all necessary efforts to comply.

Discussion: "Township reserves the right to pause facility operations until noise-mitigating resolutions are made to the Township's satisfaction".

4. Generator Use Requirements

- a. Generator use is limited to emergency backup power generation during area power outages only, shall operate 50% or less of the total facility operations, for no more than 12 hours a day (8am-8pm), with occurrence for use not to exceed three (3) consecutive days without a twenty four (24) hour continuous break/off period.
- b. Generators shall be connected to utility provided natural gas only.
- c. Generator testing hours: Testing of generators shall be limited to 9am-1pm weekdays only, except for holidays, not to exceed occurrence on more than ten (10) days per each calendar month. The facility shall provide a generator testing schedule, posted on a website for public access, updated 60 days in advance.
- d. Generator fuel storage requirements.
 - i. Fuel storage tanks shall not be within the required setbacks.
 - ii. Fuel storage tanks shall be placed underground or be screened on all four (4) sides with a fence or wall following the requirements of Sections 14.26 and 28.08.
 - iii. Fuel storage tanks shall have a maximum capacity of two thousand five hundred (2,500) gallons.

Discussion required- if natural gas, then no fuel storage needed

5. Electrical and Utility Lines

- a. All electrical and utility lines shall be placed underground.

6. Lot Coverage and Setbacks Requirements

- a. Lot coverage is limited to 50% for all impermeable **And permeable** surfaces.
- b. Setbacks: Minimum setback requirements for all structures equipment and storage yards shall comply with Table X except that employee and visitor parking lots may be set back no less fifty (50) feet from all property lines.

Discussion needed: Difference between distancing from SR outside property lines and setbacks within RPC 100' setbacks within (50' for parking); subject to change based on site; no other structures within setbacks

7. Massing, Scale, Height and Orientation Requirements

- a. Building mass, height, bulk, scale, and proportion shall maintain consistency with the existing character of the adjacent buildings.
- b. Building design should employ coordinated massing to produce overall unity, scale, and interest.
- c. Rooflines and pitches shall be proportionate to nearby structures so as to provide transition or mitigation of significant changes to scale.
- d. Maximum height for all buildings is 50 feet, including all rooftop equipment, which shall be concealed by a parapet wall.
- e. Orientation shall prioritize utilization of buildings for sound mitigation and visual buffer(s):
 - i. Where multiple buildings exist they shall be oriented so that service areas face each other and the buildings are placed to surround any equipment, mechanical yards, substations, generators, etc. in order to utilize the buildings as a sound barrier and as a visual buffer between the loudest operations on the site and the site borders.
 - ii. If a site contains two or fewer buildings, the buildings shall be oriented to place any equipment, mechanical yards, substations, generators, etc. on the farthest side/greatest distance away from the highest number of nearby residential and sensitive receptor parcels, and the building(s) between as a sound barrier and as a visual buffer between the loudest operations on the site and the residential and sensitive receptor parcels.
 - iii. Any equipment, mechanical yards, substations, generators, and similar elements shall be fully enclosed whenever possible if located within one thousand five hundred (1,500) feet from any residential property line.

8. Architectural Design and Building Materials

- a. Facade variation. Wall designs must provide a minimum of three of the following elements, in addition to transparency requirements, occurring at intervals no greater than 25 feet horizontally and 10 feet vertically:
 - i. Expression of structural system and infill panels through change in plane not less than three inches.
 - ii. System of horizontal and vertical scaling elements, such as belt course, string courses, cornice, pilasters.

- iii. System of horizontal and vertical reveals not less than one inch in width/depth.
- iv. Variations in material module, pattern, and/or color.
- v. System of integrated architectural ornamentation.
- vi. Green screen or planter walls.
- vii. Translucent, fritted, patterned, or colored glazing.
- vii. Transparency as required in Section 16.23(F)(2)(b).

b. Transparency

- i. Windows for building sides shall be concentrated toward the front edge of the building, in locations most visible from an urban open space or public right-of-way.
 - ii. Transparency alternatives. The following alternatives may be used singularly or in combination for any side or rear facing facade which requires transparency. If used in combination, they may count toward no more than 50% of the transparency requirement set forth in Section 16.23(F)(2)(b).
- c. Architectural style shall not be restricted. Rather, evaluation of the appearance of a project shall be based upon compatibility and the quality of its design and relationship to surroundings.
 - d. Buildings within the same development should be designed to provide a unified and easily identifiable image. Methods to achieve this include using similar architectural styles and materials, complementary roof forms, signs, and colors.
 - e. Minimize monotony of expansive exterior walls by incorporating the following elements: staggering of vertical walls; recessing openings; providing upper-level roof overhangs; using deep score lines at construction joints; contrasting compatible building materials; use of variety and rhythm of window and door openings; use of horizontal and vertical architectural elements, use of horizontal bands of compatible colors; and providing changes in roof shape or roofline.
 - f. Facades shall provide visual interest from both vehicular and pedestrian viewpoints.

- g. Entrances to individual buildings shall be readily identifiable to visitors through the use of recesses or pop-outs, roof elements, columns, or other architectural elements.

9. Cooling System Requirements

- a. Any system designed for cooling of the facility and/or equipment shall not negatively impact the surrounding region by conforming to the following requirements:

Discussion: omission and importance of “legislative findings”

- b. In addition to facilitating all PUE, TUE, and WUE standards in Section G.2.a, equipment cooling systems shall utilize closed-loop, direct liquid server cooling, with air movement limited to manufacturer-installed internal server fans used for auxiliary component cooling, in the following order of preference:
 - i. Utilization of liquid immersion cooling systems shall be prioritized, with preference for use of plant-based biodegradable non-flammable fluid over traditional dielectric fluid.
 - ii. If a proven incompatibility with liquid immersion cooling can be demonstrated and verified by an independent third party certified thermal engineer chosen by the Township, then utilization of zero-water direct-to-chip cooling systems may be approved for use as an alternate design option.
 - iii. If the applicant can provide documentation for another equipment cooling system which is equally or more efficient than liquid immersion cooling and zero-water direct-to-chip cooling in terms of energy and water consumption, and equally or better at emitting a minimum of all frequencies of noise, then the township may approve its use as an alternate equipment cooling system.
 - iv. If another equipment cooling system option proves to be more efficient in terms of energy and water consumption, and its heat-rejection equipment is equally or better at emitting a minimum of all frequencies of noise as liquid immersion cooling and zero-water direct-to-chip cooling, once verified by a independent third party certified thermal engineer that system shall be required as the first preference.
 - v. If a proven incompatibility can be demonstrated and verified with any preferred equipment cooling system then the next preferred cooling system as outlined above will be the default alternate.
 - vi. No room-level or facility air/fan-based cooling systems such as, but not limited to, Computer Room Air Conditioning shall be used as the primary means of heat removal.
 - vii. Open-loop cooling systems and open-circuit cooling towers shall not be permitted.
 - viii. Cooling towers shall be closed-circuit and utilize drift eliminators.
 - ix. No Dry Coolers, Mechanical Draft, or Air Chillers shall be permitted.
 - x. In order to emit a minimum of noise, as is the intent of this ordinance, cooling systems and towers shall utilize the following features:
 - a. Sound-absorptive enclosures
 - b. Fans, motors, and pumps shall be mounted on vibration isolator

Alternative: Equal or better PUE/TUE/WUE

- c. Intake and discharge/exhaust silencers
- d. Aerodynamic fan noise reduction aids
- e. Water-splash/basin silencers for water towers.
- f. Additional noise mitigation measures, especially for low frequencies and infrasound, may be required to ensure compliance with the noise limits in Section E.2.

“Additional or accessory structures shall be permanent in nature and shall have a foundation” was omitted

10. Accessory structure requirements:

- a. Temporary or modular structures are not permitted.
- b. Accessory structures shall be cohesive in design and color scheme to main structures on the parcel.
- c. The use of intermodal shipping containers for storage and/or housing of any materials, substances or equipment is prohibited. Once the facility is operational, shipping containers are limited to shipping and receiving purposes only, shall not remain in place for longer than two (2) weeks at a time, and may not be located within set back areas nor within highly visible areas for any period of time.

11. Detention ponds

- a. Detention and retention ponds are only permitted as part of the site drainage and stormwater management plan.
- b. Detention and retention ponds for discharged facility water holding or use related to cooling purposes are not permitted.

Discussion: RRC fencing suggestions removed; are existing standards suitable?

G. Sustainability and Energy Use Requirements

1. Infrastructure Impact Statement

Applicants shall submit an Infrastructure Impact Statement at the time of conditional rezoning or permitted principal special use with conditions application, which must identify:

- a. Utility Capacity Impact Statement from-the following providers to confirm service adequacy:
 - i. DTE **or** Consumers Energy, **or other utility provider.**
 - ii. Marion-Howell-Oceola-Genoa (MHOG) Water Authority, **or other water authority.**
- b. Anticipated electric power demand (MW).
- c. Anticipated water usage for cooling and other operations (gallons per day).

- d. Waste heat recovery, reuse, or discharge methods.
- e. Planned on-site backup generation capacity (MW) and associated fuel type(s) with fuel storage capacity and design.
- f. Anticipated natural gas demand.
- g. Anticipated utility infrastructure upgrades required to serve the facility, with an agreement that the developer will pay 100% of all required upgrades.

Discussion: natural gas vs diesel; would this be needed if NG?

2. Energy Efficiency **Discussion needed: RRC-suggested MW caps removed (pg 23/33); as compute power grows more dense, more power = more heat = more cooling = more water & noise**

- a. Data Centers must be designed to achieve a Power Usage Effectiveness (PUE) of 1.2 or lower, a Total Power-Usage Effectiveness (TUE) of 1.15 or lower, and a Water Usage Effectiveness (WUE) of 0.5L/kWh or lower. Applicant shall provide a report detailing how these parameters will be met, to be verified by a 3rd party professional consultant chosen by the Township.
- b. Facilities shall incorporate best practices for energy conservation, including but not limited to: high-efficiency HVAC systems, waste heat reuse, variable-speed drives, and hot/cold aisle containment.
- c. Applicant shall provide an operations Report detailing anticipated power demand and redundancy systems. **Not needed if CRAC/CPAH are not allowed**
- d. Applicant shall provide a heat recovery or reuse feasibility analysis (waste heat for district energy)

Discussion: Land-use implications of requiring solar; 1GW = 2500+ acres for 25% (see Conway/Cohoctah); already required by state

3. Renewable Energy Integration

- a. Applicants are encouraged to incorporate on-site renewable energy generation (e.g., solar, wind, geothermal, DAKET, Renewable “Green” Hydrogen Fuel Cells) ~~or to procure renewable energy from off site sources.~~ No on-site nuclear power generation shall be permitted. Decarbonized “Blue” Hydrogen and Traditional “Gray” Hydrogen are not permitted.
- b. ~~At least 25% of projected annual energy demand shall be demonstrated to be met through renewable energy sources, whether on site or through power purchase agreements, renewable energy credits, or utility green power programs.~~

Discussion: renewable energy credits don't result in more renewables being used

c. On-site solar generation components shall comply with the requirements for solar in section ___ of the ordinance.

Discussion: deferring to REO? or additional rules due to SU?

d. Energy storage systems shall be limited to Long-Duration Energy Storage (LDES). Battery Energy Storage Systems (BESS) are not permitted.

Updated language was omitted; Discussion: LDES interchangeable with BESS; other features to ensure safety are more relevant

4. Water Conservation

- a. If approved as an alternate option, facilities using water-based cooling must demonstrate the use of recycled, reclaimed, or non-potable water sources to the maximum extent feasible.
- b. No on-site wells shall be permitted.

5. Green Building Practices

- a. Facilities shall be designed to achieve LEED Silver certification or an equivalent third-party sustainability certification, to be verified by an independent third party certified professional consultant chosen by the Township, and shall provide documentation of certification within two (2) years of construction for each building.

6. Air Quality

- a. Regulatory Compliance: All generators, cooling systems, and other emission sources shall comply with federal Clean Air Act requirements and the Michigan Department of Environment, Great Lakes, and Energy (EGLE) air quality rules.
- b. Permitting: Facilities shall obtain and maintain any required Air Use Permit to Install (PTI) or other approvals from EGLE for stationary engines, cooling towers, or fuel storage.
- c. No on-site baseload power generation shall be permitted with the exception of the renewable energy generation listed in section G.3.a.
- d. Generator Emissions
 - i. Generators shall meet or exceed current EPA Tier 4 Final emissions standards.
 - ii. Generator Dispersion modeling could be required to meet air quality requirements or if a facility is within 500 feet of any residential, or sensitive receptor parcels.

- e. Renewable “Green” Hydrogen Fuel Cells systems are permitted for backup power generation. Decarbonized “Blue” Hydrogen and Traditional “Gray” Hydrogen are not permitted.
- f. Emissions Reporting: Applicants shall submit an annual statement to the Township confirming compliance with EGLE permits and reporting actual operating/testing hours of backup generators.

7. Ongoing Reporting

- a. Owners and operators shall provide an annual sustainability report to the Township, including:
 - i. Actual annual energy consumption (MWh).
 - ii. Actual annual water usage withdrawal and discharge (gallons).
 - iii. **Energy efficiency performance & progress toward renewable energy targets.** **“Progress toward targets” not needed if requirements are omitted**
 - iv. Documentation of any energy efficiency, cooling system upgrades, and security upgrades.
 - v. Actual Power Use Effectiveness (PUE), Total Power-Usage Effectiveness (TUE) and Water Usage Effectiveness (WUE).
 - vi. Actual generator runtime/use logs (hours).
 - vii. Actual job numbers, including how many employees are Livingston County Residents.
 - viii. Greenhouse gas emissions and/or carbon intensity of energy consumed.

10. Use of Consultants

The Township may hire third-party, independent consultants chosen by resolution of the township, to be funded by the developer through an escrow account to review energy efficiency, water consumption usage, air quality review, renewable energy implementation, and green building practices.

H. Security & Emergency Access

Security and Emergency Access. Data Centers shall be designed and operated to protect the facility, surrounding community, and public safety resources.

1. Perimeter Security

- a. Data Centers shall be fully enclosed with a perimeter security system, which may include fencing, or walls that meet the requirements of Sections 14.26 and 28.08. All fences or walls shall not be less than eight (8) feet in height.
- b. Security barriers shall be designed to balance safety with community character; opaque fencing must be screened with landscaping where visible from public roads or residential areas.

2. Controlled Access

- a. All site entrances shall include controlled access gates, guard stations, or equivalent security technology to prevent unauthorized entry.
- b. Visitor and delivery access points must be separated from employee access points wherever feasible.

3. Emergency Access

- a. A minimum of two (2) points of emergency vehicle access shall be provided, with clear signage and unobstructed pathways around the building.
- b. Access drives shall be constructed to fire department standards, with sufficient load-bearing capacity for emergency apparatus.
- c. Fire lanes shall be maintained free of obstructions at all times.

4. Camera Surveillance

- a. Data Centers shall install and maintain a perimeter camera surveillance system capable of monitoring all vehicular and pedestrian access points, building entrances, and outdoor mechanical/equipment areas.
- b. Cameras shall be positioned to minimize intrusion into adjoining residential properties and public rights-of-way, while still providing full coverage of the site.

- c. Camera systems shall be continuously operational (24 hours per day, 7 days per week) and recordings shall be retained for a minimum of 30 days.
- d. A security plan, including camera layout, monitoring procedures, and data retention policies, shall be submitted as part of site plan review.

5. Fire Protection and Suppression.

- a. Data Centers shall be equipped with an automatic fire detection and suppression system designed to protect both building occupants and sensitive equipment.
- b. Suppression systems shall comply with National Fire Protection Association (NFPA) standards and be approved by the Fire Marshal.

6. Hazardous Materials Management.

- a. Any use of hazardous materials (including fuels for backup generators, batteries, and chemicals for cooling systems) shall comply with federal, state, and local storage, reporting, and disposal requirements.
- b. Applicants shall provide a Hazardous Materials Management Plan identifying on-site materials, safety data sheets, storage methods, spill prevention measures, and emergency response procedures.
- c. Applicant shall provide a fire protection plan.

7. Emergency Response Coordination.

- a. Applicants shall submit an Emergency Response Plan to the Township at the time of Site Plan review, which must include:
 - i. Site layout for emergency responders.
 - ii. Fire suppression and alarm systems description.
 - iii. Backup generator location and fuel storage details.
 - iv. Contact information for on-site security and facility management.

- b. Operators shall provide annual training opportunities or site orientations to local fire, police, and emergency medical services.

Discussion: confirmation from local emergency responders about ability to respond to calls was omitted; this is important to verify, and to ensure developers are covering costs to respond to their unique risks, not taxpayers

8. Lighting and Surveillance.

- a. A lighting plan is required. The lighting plan shall include a photometric grid overlaid on proposed site plan showing light intensity (in foot-candles) on site and 25 feet beyond parcel lines.
 - i. Lighting shall adhere to Dark Sky principals—full-cutoff, directed downward, and shielded, with the use of motion sensors and timers where able. Illumination shall not exceed 0.1 footcandles onto adjacent properties measured three (3) feet from the ground.
- b. Facilities shall incorporate continuous video surveillance of access points, perimeter fencing, and loading areas, with recordings maintained for a minimum of thirty (30) days.

I. Construction Standards

Discussion: 1-3 seem to be both redundant and conflicting

1. Applicant shall have a community complaint resolution liaison available 24 hours a day beginning with construction. The contact information shall be posted in a visible location from the road frontage, as well as provided to the township to be published on the website.
2. All complaints shall be responded to within 24 hours, and if not completely resolved then a resolution plan shall be provided to the township and complainant.
3. Construction shall adhere to the hours in the Township Ordinance. No construction is allowed to take place outside of those hours. **Discussion: Ordinance is only about hours of noise, not work hours. Intent is to limit not just noise, but activity due to light, traffic, etc.**
4. Construction Phase Requirements:
 - a. The developer or owner/operator will provide a full time onsite community liaison and 24 hour emergency line that will be available from the start of construction until full facility commissioning, this position shall have the authority to halt construction if necessary. Contact information for the community liaison shall be posted at the site on easily accessible / viewable signage and posted on the township website. All concerns and complaints shall receive confirmation of receipt within 24 hours and response within 5 business days.
 - b. A detailed schedule for any pile driving necessary and a complaint resolution plan shall be provided to the township prior to any construction work beginning.
 - c. On site work shall be conducted Monday through Friday between the hours of 7am and 6pm.

J. Decommissioning

Discussion: Omission and importance of “legislative findings”

1. Decommissioning Plan Requirement. As a condition of site plan and special use approval, the applicant shall submit a Decommissioning and Site Restoration Plan that addresses

- a. Triggers for decommissioning.
- b. Methods for removal of structures, equipment, utilities, and impervious surfaces.
- c. Recycling and disposal of equipment and hazardous materials.
- d. Final grading, soil stabilization, and revegetation.
- e. Restoration of the site to a condition compatible with surrounding uses.

2. Triggers for Decommissioning

Discussion: repeat violations as triggers, per (not-included) Section K

- a. ~~A use with high resource use~~ **High impact land use** shall be considered abandoned if it ceases operations for a period of 12 consecutive months, unless the owner provides evidence of intent to resume operations.
- b. Decommissioning must begin within 6 months of abandonment and be completed within 12 months.
- c. If at any time a high impact land use ceases operations for any amount of time, the structures and property, including landscaping and snow removal, shall be maintained at all times.

Seems redundant with J.4.e., and also not a “Trigger for Decommissioning”

3. Performance Guarantee / Financial Assurance

- a. Prior to issuance of a building permit, the applicant shall post a financial guarantee in the form of a **letter of credit**, bond, or escrow account acceptable to the Township.

Is a letter of credit equal or more legally binding as a bond or escrow account with guaranteed funds?

- b. The amount shall equal 125% of the estimated decommissioning cost, as determined by an independent third-party, qualified engineer and approved by the Township.
- c. Estimates must be updated every 2 years and adjusted for inflation.

4. Removal Standards

- a. All above-ground structures, including buildings, mechanical equipment, cooling towers, security fencing, and pavement not otherwise serving a reuse, shall be removed.
- b. All Below-ground infrastructure, such as foundations and utilities, shall be removed to unless otherwise approved.
- c. Materials shall be recycled to the maximum extent practicable.
- d. If the Planning Commission determines, based on independent, third-party contractor analysis and report paid for by the landowner in escrow, that existing primary buildings and/or office buildings have a viable use for other Permitted Principal Uses in the underlying zoning district, then the buildings identified may be exempted from being fully removed.
 - i. The Planning Commission may allow the primary and office buildings to be renovated to be able to be repurposed for another viable Permitted Principal Use in the underlying zoning district.
 - ii. The owner/operator shall provide full building plans detailing the renovations, and shall provide the cost, in escrow, for an independent, third-party contractor chosen by the township to verify the viability of the renovations for reuse.
 - iii. All other specialized structures, mechanical yards, cooling equipment, and infrastructure that are not deemed to be repurposed for other, existing Permitted Principal Uses in the district shall be fully decommissioned according to Section H.4.a, b, and c.

Discussion: Added based on research about "Can the Twp require full removal?"- LivCo PC; not necessarily something the RRC feels is better than leaving it at full removal; is this the same as J.5.b?

- e. The facility and property shall be maintained at all times, including snow removal and landscaping, even when not operational including during and after decommissioning.

5. Site Restoration

- a. The site shall be restored with topsoil, seeded or planted with native vegetation, and stabilized to prevent erosion.
- b. The Township may approve alternate restoration plans if the site is proposed for redevelopment consistent with the Master Plan and zoning ordinance. **Is this the same intent of the highlighted section above? If so, the above is more thorough**

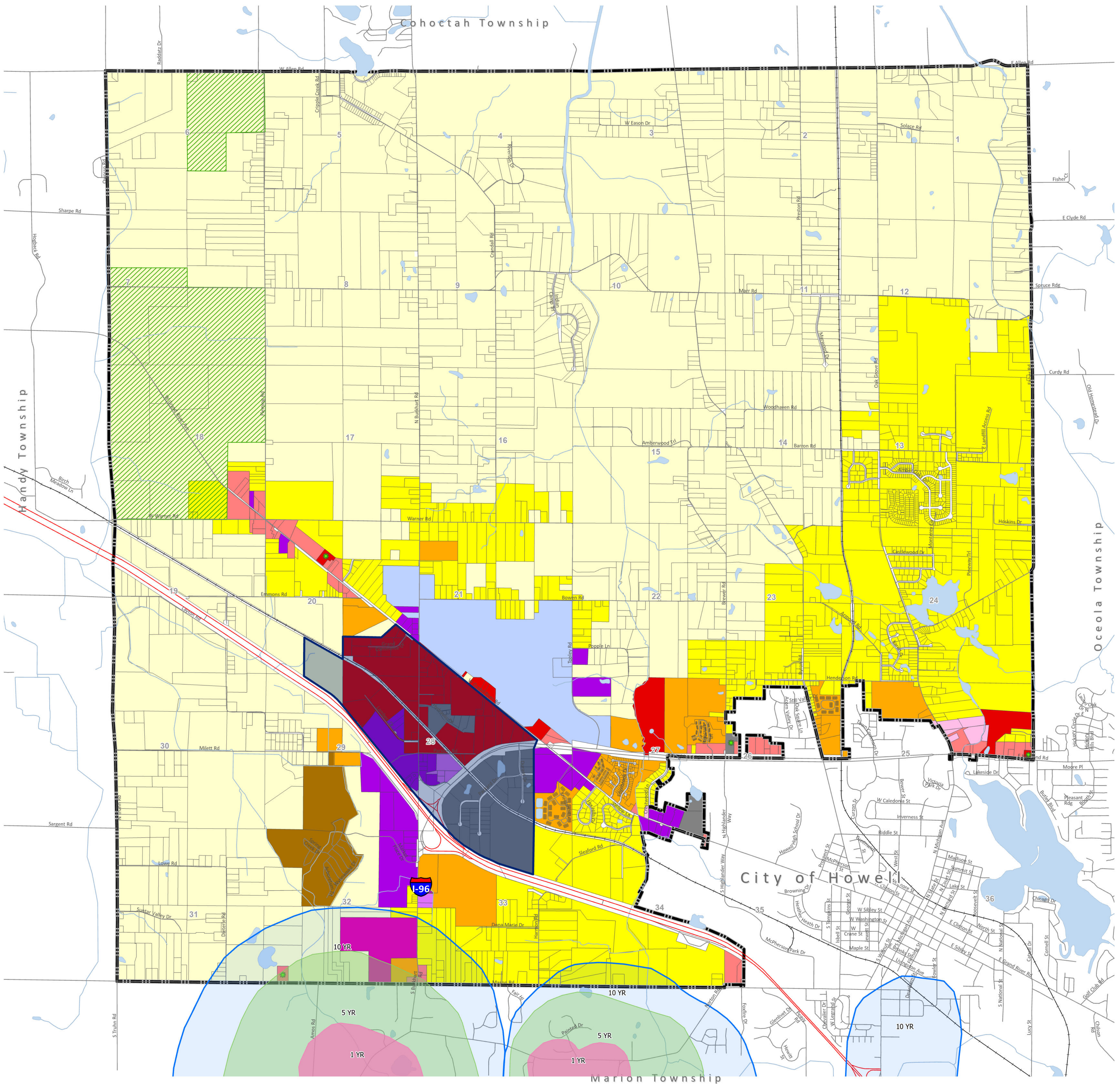
6. Failure to Decommission

- a. If the owner fails to complete decommissioning in accordance with the approved plan, the Township may draw upon the financial guarantee to complete the work.
- b. Any costs exceeding the financial guarantee shall remain the responsibility of the property owner.

Additional Sections not Included, Need Discussion:

1. Sections K, L, and M

2. Indemnification (see Henrietta, MI)



Zoning Designation			
	Conditional Zoning		Proposed Data Center Overlay District
	PUD - Planned Unit Development		HSC - Highway Service Commercial
	AR - Agricultural Residential		IFZ - Industrial Flex Zone
	SFR - Single Family Residential		I - Industrial
	MFR - Multiple Family Residential		RT - Research & Technology
	MHD - Manufactured Housing District		Renewable Energy Overlay District
	OS - Office Service		NSC - Neighborhood Service Commercial
			1 YR Wellhead Protection Area
			5 YR Wellhead Protection Area
			10 YR Wellhead Protection Area

PROPOSED ZONING DISTRICTS MAP

Howell Township
Livingston County

0 0.5 1 2 Miles



Carlisle/Wortman Associates, Inc.
Ann Arbor, Michigan
May 2026

