HATBORO [1]

MONTGOMERY COUNTY, PENNSYLVANIA

ORDINANCE NO. _____

AN ORDINANCE OF THE BOROUGH COUNCIL OF THE BOROUGH OF HATBORO, PENNSYLVANIA, TO AMEND THE HATBORO CODE OF ORDINANCES TO DEFINE AND ADD SPECIFIC REQUIREMENTS FOR DATA CENTERS AND DATA CENTER ACCESSORY USES.

WHEREAS, Article VI of the Pennsylvania Municipalities Planning Code, 53 P.S. § 10601, *et seq.*, authorizes the BOROUGH OF HATBORO to enact, amend and repeal Zoning Ordinances within the BOROUGH OF HATBORO and

WHEREAS, the BOROUGH COUNCIL deems it to be in the best interest and general welfare of the residents of the BOROUGH OF HATBORO to update and amend provisions of the HATBORO Zoning Ordinance to provide for Data Centers and Data Center Accessory Uses; and

WHEREAS, the BOROUGH COUNCIL desires to add provisions to the Zoning Ordinance relating to Data Centers and Data Center Accessory Uses;

NOW, THEREFORE, BE IT ORDAINED AND ENACTED, by the BOROUGH COUNCIL of the BOROUGH OF HATBORO as follows:

Section 1. Chapter 27 Part 1 of the HATBORO Code of Ordinances, entitled Definitions, is amended to add the following definitions:

Data Center: A building or buildings which are occupied primarily by computers and/or telecommunications and related equipment where digital information is processed, transferred and/or stored, primarily to and from offsite locations. This use does not include computers or telecommunications related equipment that is secondary and customarily incidental to an otherwise permitted use on the property, such as servers associated with an office building. This use shall also include cryptocurrency mining, blockchain transaction processing, and server farms. A Data Center may include Data Center Accessory Uses.

Data Center Accessory Use: Ancillary uses or structures secondary and incidental to a Data Center use, including but not limited to: administrative, logistical, fiber optic, storage, and security buildings or structures; sources of electrical power such as generators used to provide temporary power when the main source of power is interrupted; electrical substations; utility lines; domestic and non-contact cooling water and wastewater treatment facilities; water holding facilities; pump stations; water towers; environmental controls (air conditioning or cooling towers, fire suppression, and related equipment); security features, provided such data center accessory uses/structures are located on the same tract or assemblage of adjacent parcels developed as a unified development with a Data Center. The use shall not

[1] Where terms are in brackets, municipalities should select the appropriate term. Where text is highlighted, footnotes provide additional information about the provision.

include energy generation systems used or intended to be used to supply power to the Data Center during normal operations.[2]

Data center operator: The person or entity responsible for the post-construction operation of a data center.

Sensitive receptor:[3] any residential use, school, preschool, child or adult day-care center, hospital, assisted-living facility, long term care facility, nursing home, personal care home, retirement community, treatment center, community center, place of worship, park (excluding trails), campground, or dormitory.

Sustainable yield[4]**:** The amount of ground water that can be safely withdrawn from an aquifer annually without producing an undesirable result. Undesirable results include, but are not limited to, depletion of groundwater storage, the intrusion of water of undesirable quality, the contravention of existing water rights, excessive depletion of surface waters by induced infiltration, and land subsidence.

Section 2. A Data Center and Data Center Accessory Uses shall be permitted in the IN and LMX Zoning Districts by conditional use.[5]

Section 3. Section XXX (Standards for Specific Uses) is amended to add Section XXX, Data Centers and Data Center Accessory Uses, as follows:

XXX-XX **– Data Centers and Data Center Accessory Uses**

A. Data Centers shall be permitted by CONDITIONAL USE[6] in the IN and LMX Zoning Districts when approved in compliance with the procedures, standards, and criteria contained in this section.

B. **Dimensional Standards.** The dimensional standards of Data Centers and Data Center Accessory Uses shall be in accordance with [identify existing standards applicable to relevant zoning district, if applicable], with the following exceptions:

1. The minimum lot area shall be [X] acres.
2. The maximum building height for a Data Center shall be 60 feet, to include roof-mounted equipment such as cooling and ventilation systems, HVAC units, and cooling towers.
3. The maximum height of Data Center Accessory Uses shall be no greater than the height of the principal building, exclusive of roof-mounted equipment.

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[2] If a municipality does not already have such ordinances, PennFuture recommends a separate ordinance or ordinances governing power generation facilities such as gas-fired power plants, solar arrays, and wind farms. Given the potential that power generation facilities serving data centers will be very large, PennFuture does not believe it is appropriate to treat them as accessory uses.

[3] This list of uses can be adjusted if different terms are used in the municipality's existing zoning ordinance.

[4] This is a modified version of the definition found in the publication, *Examining Safe Yield and Sustainable Yield for Groundwater Supplies and Moving to Managed Yield as Water Resource Limits Become a Reality,* by S.J. Meyland of the Department of Environmental Technology at the New York Institute of Technology.

[5] PennFuture cannot make universal recommendations about where data centers should be located. Each municipality must make this determination based on the characteristics of its own community.

[6] PennFuture recommends that data centers be conditional uses or special exceptions in almost all cases but recognizes that there are limited circumstances where permitting the use by right may be acceptable.

4. Data Centers and Data Center Accessory Uses shall be set back a minimum of 200[7] feet from the boundary of [identify residential or other appropriate zoning districts] or the lot line of any property developed with a Sensitive Receptor.

5. Data Centers and Data Center Accessory Uses shall be set back a minimum of 200 feet from all other adjoining property lines and road rights-of-way.

C. **Landscape Buffer[8]; Fencing.** A landscape buffer is required between Data Centers and Data Center Accessory uses and any adjoining [residential zoning district], Sensitive Receptor, or public roadway. The landscape buffer shall comply with the following requirements:

1. The landscape buffer shall be at least [25] feet in width and may be part of the minimum setback distance.

2. The landscape buffer shall be free of structures, dumpsters, storage or display areas, signs, materials, loading or unloading areas, and vehicle parking.

3. The landscape buffer shall include plantings to achieve a dense, opaque, four-season screen and shall consist of native species planted as follows:

   a. One (1) large evergreen tree per 25 linear feet of buffer. The size of large evergreen trees shall be a minimum of eight (8) feet in height at the time of planting.

   b. One (1) deciduous canopy (shade) tree per 75 linear feet of buffer. Size of canopy (shade) trees shall be a minimum of 2½ inch caliper at the time of planting.

   c. One ornamental/flowering tree per 50 linear feet of buffer. The size of ornamental/flowering trees shall be a minimum of eight (8) feet in height for multi-stemmed varieties, or 2½ inch caliper at the time of planting for single-stemmed varieties.

   d. Five (5) shrubs per 25 linear feet of buffer. Size of shrubs shall be fully branched and minimum of three feet in height at the time of planting. Shrubs shall be a combination of evergreen and deciduous species, with a minimum of 50% being evergreen.

4. All plantings shall conform to the standards of the the Borough's list of acceptable plant species[9], or shall be approved by the Borough Council upon recommendation by the [municipal] Engineer, and/or Pennsylvania-registered landscape architect, or certified arborist.

5. A variety of species shall be used in order to prevent monocultural plantings. American arborvitae and similar weak-stem plants shall not be used to meet the buffer yard requirements. If more than 20 evergreen plants are proposed, no more than 50% shall be of one species.

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[7] Each municipality must determine the appropriate setback distances in light of the possible location of the data center(s) and its relationship to the surrounding zoning districts and uses. Setbacks should be large enough to protect neighboring uses from negative impacts but cannot be so large as to create a *de facto* exclusion.

[8] Municipalities may cross-reference existing landscaping requirements or omit this section entirely if these standards already exist elsewhere in its ordinances.

[9] Omit this phrase if the municipality does not have a list of acceptable plant species.

6. A monotonous straight row of the same species shall not be permitted. A more naturalistic form of planting with a mix of species shall be provided.
7. In the event that existing topography and/or vegetation is adequate to meet the intent of the required buffer yard, such existing topography and/or vegetation may constitute all or part of the required buffer yard.
8. All buffer yard plantings shall be perpetually maintained by the property owner. Any plant material that dies, is removed, is diseased, or is severely damaged shall be replaced by the current property owner, on a one-to-one basis, as soon as is practical considering growing seasons, within a maximum of 150 days.
9. All buffer yard screening shall be assured by a performance guarantee posted with the Borough Council in an amount equal to the estimated cost of all such trees, shrubs, plantings, and installation. Such guarantee shall be released only after passage of the second growing season following planting.
10. Fencing of the property is permitted, provided that fencing along public and private roadways is not chain-link, with or without slatted inserts, and does not include barbed wire or other similarly visibly intrusive deterrence device. An applicant shall not be required to comply with this requirement if fencing is fully screened from view by one or more of the means identified in subparagraph 1 above.

D. **Equipment Screening**

1. To provide visual screening and reduce noise levels, ground-mounted and roof-mounted equipment used for cooling, ventilating, or otherwise operating the facility, including backup power generation equipment, that is located within 300 feet of a public roadway, [residential or other relevant zoning districts][10], or the lot line of any Sensitive Receptor must be fully enclosed, except where not mechanically feasible based on the manufacturer's specifications. If it is not mechanically feasible to fully enclose the equipment, it must be fully screened from view using one or more of the following means:
    a. The landscape buffer required by subsection (C) above.
    b. By existing vegetation that will remain on the property.
    c. By the principal Data Center building or an accessory building
    d. A berm averaging a minimum of five (5) feet in height above the adjacent average ground level with a maximum side slope of 3:1, provided that the berm shall be covered by a well-maintained all season natural ground cover and any required screening plantings shall be arranged on the outside and top of the berm.
    e. A visually solid fence, screen wall or panel, parapet wall, or other visually solid screen that shall be constructed of materials compatible with those used in the exterior construction of the principal building.

[10] The municipality should name appropriate zoning districts here.

E. **Noise and Vibration**

1. No Data Center or Data Center Accessory Use, or any combination of Data Center and Data Center Accessory Uses developed as part of a unified development, shall cause or contribute to sound levels in violation of the standards established by this section. Where there is a conflict between this section and any other section of this chapter, the provisions of this section shall apply.

2. **Definitions.** The following definitions shall apply to this section:

   a. **A-weighted fast response maximum sound level (L_{MAX}).** The maximum sound pressure level in decibels (dB) measured over a given period of time, with A-frequency weighting and fast response time-weighting applied.

   b. **Compliance metric:** L_{EQ}, L_{MAX}, L_{PK}, or L_{PTL}.

   c. **Daytime Hours:** the hours between 7:00 am and 6:00 pm on weekdays and between 9:00 am and 6:00 pm on weekends and holidays

   d. **Equivalent continuous sound level (L_{EQ})**. The steady sound pressure level in decibels (dB) which, over a given period of time, has the same total energy as the fluctuating noise measured over the same period of time.

   e. **Evening Hours:** the hours between 6:00 pm and 10:00 pm

   f. **Log Average Level (LAL_{xx})**: The logarithmic average of the interval measurements of a compliance metric, computed as follows:

$$LAL_{xx} = 10 \log_{10} \left[\frac{1}{nP_o^2} \sum_{k=1}^{n} P_o^2 \quad 10^{L_{xk}/10}\right]$$

$$= 10 \log_{10} \left[\{10^{\frac{L_{x1}}{10}} + 10^{\frac{L_{x2}}{10}} \ldots 10^{\frac{L_{xn}}{10}}\}/n\right]$$

   Where:

   LAL_{xx} = log average level in dBA or dB where L_{xx} represents either L_{EQ}, L_{MAX}, L_{PK}, or L_{PTL}.
   L_{x1} = level of the first interval measurement in dBA or dB
   L_{x2} = level of the second interval measurement in dBA or dB
   L_{xn} = level of the n^{th} interval measurement in dBA or dB
   n = the number of measurement intervals
   P_0 = standard reference pressure of 20 micro pascals

   A minimum of 20 intervals of one minute each measured over a single period of 24 hours shall be used, however, intervals need not be contiguous. Intervals with louder, and preferably the loudest noise, should be used.

   g. **Natural Environmental Sounds:** Environmental sounds that are inherent to the area and due to naturally occurring sounds such as insects, rustling leaves, wind, wild birds, wild animals, frogs, rain, lightning, or weather, but not including the noise of domesticated animals.

   h. **Normal Community Sound:** Sound that is inherent to and consistent with the norms of the community and which the average resident would reasonably expect

to occur in their community. Normal Community Sound may include, but is not limited to, children playing, occasional dog barks, domestic power tools, residential HVAC equipment, and reasonable transportation sounds that meet state, federal, and local noise requirements and limits.

i. **Nighttime Hours:** the hours between 10:00 pm and 7:00 am on weekdays and between 10:00 pm and 9:00 am on weekends and holidays.

j. **Pure tone:** A sound occurring at a discrete frequency as determined by a Fast Fourier Transform measurement (narrow band analysis) of a sound using a dynamic analyzer with at least 1 Hz and preferable 1/8 Hz resolution, a Hanning window, and sufficient averaging to determine the magnitude of the pure tone level that is exceeded 5% of the time (i.e. an exceedance rate of L_5).

k. **Pure Tone Level (L_{PTL}).** The magnitude in decibels (dB) of a pure tone, with no weighting applied.

l. **Receiving Property:** Real property impacted by noise generated by a Data Center and/or Data Center Accessory Uses. A Receiving Property need not be directly adjacent to the parcel or collection of parcels on which the Data Center or Data Center Accessory Use(s) are located but shall not include any real property incorporated as part of a unified design with the Data Center whose compliance is being evaluated.

m. **Un-weighted peak sound pressure level (L_{PK}).** The maximum instantaneous sound pressure level in decibels (dB) that occurs during a stated time interval, with no weighting applied.

3. **Sound level limits**.

a. For purposes of compliance with this subsection, sound shall be measured at the point, at any elevation, on the Receiving Property where the Log Average Level of the relevant Compliance Metric is highest.

b. LAL_{EQ} shall not exceed the following values:

Table 1: Equivalent Continuous Sound Level (L_{EQ}) Limits[11]

Zoning District	Daytime hours	Evening hours	Nighttime hours
Rural Residential, Low-Density Residential Districts, Properties containing Sensitive Receptors	50 dB	45 dB	45 dB
Medium- and High-Density Residential Districts	55 dB	50 dB	45 dB
Mixed Use, Commercial, Industrial Districts	65 dB	60 dB	55 dB

[11] The zoning districts and sound level limits used in this table are for example purposes only. Actual zoning district names and categories should be tailored to the municipality, and sound level limits should reflect the actual background noise levels of the relevant zoning districts. Additional/different categories may be necessary depending on the characteristics of the community. For example, a higher sound level limit may be appropriate along highway corridors.

c. LAL_{MAX} shall not exceed the decibel value of the Equivalent Continuous Sound Level (L_{EQ}) for the zoning district and time of day, as provided in Table 1, by more than 10 dB.

d. LAL_{PK} shall not exceed the decibel value of the Equivalent Continuous Sound Level (L_{EQ}) for the zoning district and time of day, as provided in Table 1, by more than 20 dB.

e. All LAL_{PTLs} shall be at least 10 dB below the nominal PTLxx curve at the corresponding frequency, as set forth in Table 2 below, where the value represented by "xx" is the L_{EQ} limit (in dB) set forth in Table 1 for the appropriate zoning district and time of day. Where the applicable L_{EQ} limit is not a multiple of 5, the PTL curve corresponding to the next highest 5 dB increment shall be used; interpolation between PTL curves is not permitted.

Each identified pure tone shall be evaluated independently, and where more than one pure tone is present, compliance shall be determined separately for each tone. Logarithmic averaging of tonal levels across frequencies shall not be used.

Table 2: Maximum allowable LAL_{PTL} in dB by Tone Frequency and L_{EQ} limit[12]

	Octave Band Frequency (Hz) of Pure Tone									
PTLxx curve	**16**	**32**	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**
PTL70	101	96	91	86	81	76	72	68	64	60
PTL65	96	91	86	81	76	71	67	63	59	55
PTL60	91	86	81	76	71	66	62	58	54	50
PTL55	86	81	76	71	66	61	57	53	49	45
PTL50	81	76	71	66	61	56	53	48	44	40
PTL45	79	74	68	62	56	51	47	43	39	35
PTL40	78	71	64	58	51	46	42	38	34	30
PTL35	76	69	61	54	46	41	37	33	29	25
PTL30	74	66	58	49	41	36	32	28	24	20
PTL25	73	64	54	45	36	31	27	23	19	15
PTL20	71	61	51	41	31	26	22	18	14	10
PTL15	69	59	48	37	26	21	17	13	9	5
PTL10	68	56	44	33	21	16	12	8	4	0

[12] PLT curve rows that are not within 5 dB of any L_{EQ} value in Table 1 can be eliminated.

4. **Exceptions.** The above sound level limits do not apply to sound originating from:
    a. Motor vehicles operated legally and in compliance with the noise regulations of the Pennsylvania Department of Transportation
    b. Safety and protective devices where noise suppression would defeat the safety intent of the device when being used for its intended purpose
    c. Any device intended to provide public warning of potentially hazardous, emergency, or illegal activities such as commercial, residential, or vehicle burglar alarms; back-up signals on regulated and licensed motor vehicles; fire alarms; law enforcement and fire vehicles, and similar devices
    d. Emergency equipment and emergency work necessary in the interest of public health, safety, or welfare or law enforcement
    e. Emergency standby generators during emergency use. Routine testing of generators shall comply with the sound level limits unless such testing occurs between 7:00 am and 6:00 pm on weekdays and between 9:00 am and 6:00 pm on weekends and holidays, during which time generators may exceed the sound level limits by no more than 20 dBA (20 dB for L_{PK}) for up to one (1) cumulative hour per seven (7) calendar day period.
    f. Construction noise, including site preparation, assembly, erection, demolition, substantial repair, maintenance, alteration or similar action for structures or other site improvements, provided that such construction occurs during Daytime Hours and that reasonable noise controls such as proper muffling of all engines, motors, or turbine-driven equipment, and pneumatic devices; noise enclosed air compressors and generators; sound barriers; and lagging are employed.
5. **Measurement**
    a. Terminology and measurement practices shall follow applicable ANSI S1 & S12 standards. Compliance measurements shall be made using a calibrated ANSI Type 1 or Type 2 integrating sound level meter with a dynamic range of at least 60 dB. For each measurement, the signal-to-noise ratio shall be at least10 dB.
    b. The contribution of wind noise to each compliance measurement shall not exceed 5 dBA (or dB). Measurements shall be made with properly installed windscreens, and any measurement influenced by wind noise exceeding this limit shall be discarded or repeated under acceptable conditions.
    c. Measurements shall exclude significant effects of Natural Environmental Sounds and Normal Community Sounds. The signal-to-noise ratio of the combined effect of Natural Environmental Sounds and Normal Community Sounds shall be at least 5 dBA (or dB) and preferably at least 10 dBA (or dB).
    d. Impact or impulse-type sounds shall be measured with the un-weighted Peak Sound Pressure Level (L_{PK}) using a meter specifically designed for peak measurements and conforming to the applicable ANSI S1 standards. RMS (root mean square) measurements using the “fast” response setting or any legacy “impulse” function shall not be used.

6. **Vibration.** No source of mechanical vibration or acoustically induced vibration shall cause or induce vibration on any property or in any structure (ground-borne or structural vibration) that exceeds the ISO 2631-2 Residential Day criteria. Vibration shall be measured as particle velocity in any one-third octave band and shall not exceed 200 μm/s RMS in any band.

7. **Sound and vibration study.** The applicant shall demonstrate through a sound study conducted by a professional acoustical expert that the sound and vibration generated by a Data Center and/or Data Center Accessory Uses comply with the requirements of this section. The sound study shall be conducted using generally accepted methodology in the following phases:

    a. A sound modeling study shall be conducted to demonstrate that the proposed use will comply with applicable noise requirements of this section. The sound modeling shall be performed according to ISO 9613-2 series methods or other generally accepted engineering methods for outdoor sound propagation. All significant noise sources associated with the proposed Data Center and Data Center Accessory Uses(s) shall be included. The sound modeling study shall be submitted with the [conditional use/special exception/land development application].

    b. An as-built sound study shall be conducted six months after issuance of the certificate of occupancy and prior to the final escrow release for any land development phase. An as-built sound study may also be required thereafter by the Borough. If it is determined by the as-built sound study that there is a violation of the aforesaid noise limits, it shall be considered a violation of this Ordinance.

F. **Water Supply –Water Feasibility Study.** No Data Center shall be approved unless the applicant demonstrates that there is an adequate supply of water for the proposed use and that proposed water withdrawals and discharges will not endanger or adversely affect the quantity or quality of groundwater supplies or surface waters in the vicinity.

    1. **Public water supply.** If the use will be served by a public water supply, the applicant shall submit documentation from the public authority certifying that the public authority will supply the water needed.

    2. **River basin commission approval.**[13] If the use is to rely upon nonpublic sources of water and satisfies either of the below conditions, the applicant shall provide proof of review and approval from the Delaware River Basin Commission and shall not be required to provide an additional water feasibility study.

        a. Water withdrawals of 100,000 gallons per day (gpd) or more over a 30-day average from any source or combination of sources within the Delaware/Susquehanna River Basin; or

        b. Any consumptive water use of 20,000 gpd or more over a 30-day average from any water source.

[13] This provision is applicable only for municipalities located in the Delaware and Susquehanna River Basins and should be deleted otherwise. The other river/lake commissions do not review or approve withdrawals.

3. **Water Feasibility Study.** If the use is to rely upon a nonpublic groundwater source and will withdraw [50,000] gallons per day (gpd)[14] or more over any consecutive 30-day period, or is to rely on surface water withdrawal, the applicant shall provide a water feasibility study. The purpose of the water feasibility study is to determine if there is an adequate supply of water for the proposed use and to estimate the impact of the use on existing wells, groundwater, and surface waters in the vicinity.

4. **Contents of water feasibility study.** The water feasibility study shall include the following information at a minimum:

    a. The projected water demands of the Data Center, including both average and peak daily consumption;

    b. The source of water to be used;

    c. A description of how water will be used, including the amount or proportion of water to be used for each purpose (e.g. cooling, humidity control, fire suppression, and domestic usage);

    d. A description of the amount or portion of water withdrawn that will be recycled or discharged and by what means and at what temperature;

    e. A topographic map of the area with a radius of at least one-half mile from the site including;

        i. The location of all existing and proposed wells within 3,000 feet of the property boundary, or, in the case of an assemblage of parcels, 3,000 feet of the exterior lines of the assemblage of parcels, including test wells and monitoring wells, with a notation of the capacity of all high-yield wells. This distance shall be increased to encompass the diversion and recharge areas of the proposed groundwater source if the hydrological setting analysis required by subsection (5)(a) below indicates either area will extend beyond 3,000 feet from the property boundary;

        ii. The location of all existing and proposed on-lot sewage disposal systems as well as all sewage treatment system surface water discharges;

        iii. The location of all surface waters, including perennial and intermittent streams, rivers, lakes, reservoirs, ponds, wetlands, springs, natural seeps, and estuaries and the use classification thereof (Cold Water Fishes, High Quality, Exceptional Value, etc.), if applicable, as set forth in Chapters 93 and 105 of Title 25 of the Pennsylvania Code;

        iv. Any known or potential habitats for threatened or endangered species; and;

[14] This threshold can be adjusted as the municipality sees fit. For reference, 10,000 gpd is roughly equivalent to 75 residential units, 20,000 gpd is roughly equivalent to 150 residential units, and 50,000 gpd is roughly equivalent to 375 residential units.

v. The information applicable to groundwater withdrawals or surface water withdrawals, as appropriate, as required by subsections (5) and (6), below.

vi. A statement of the qualifications and the signature(s) of the person(s) preparing the study.

5. **Groundwater withdrawals.** For groundwater sources, the water feasibility study shall include a hydrogeologic report prepared by a registered professional geologist licensed by the Commonwealth of Pennsylvania analyzing the long-term sustainable yield of the water source. The hydrogeologic report shall include:

   a. A hydrological setting analysis which includes a hydrogeologic cross section, delineation of the portion of the aquifer through which water is diverted to the well (area of diversion), delineation of the area providing groundwater recharge to the diversion area (recharge area), and identification of water resources located within the diversion and recharge areas.

   b. The results of an aquifer test conducted in accordance with Pennsylvania Department of Environmental Protection, Bureau of Safe Drinking Water, Document No. 394-2125-001, *Aquifer Testing Guidance for Public Water Systems*[15], or other generally accepted methodology. Data shall include, at a minimum, precipitation data, static water levels immediately prior to yield testing, linear hydrographs of water levels and test responses of all monitoring points through background, testing, and recovery monitoring periods, residual drawdown graphs and logarithmic hydrographs of the production well and any monitoring points that had observable drawdown as a result of operating the production well. Field notes showing original observations, water levels and flow readings and the time readings were taken shall be included.[16]

   c. Analysis and interpretation of the aquifer test data, including a determination of the aquifer's hydraulic conductivity and specific capacity; aquifer transmissivity and storage coefficient;[17] estimation of the horizontal extent of the cone of depression; and determination of a safe yield for the well, including analysis of the effects of 180 days of pumping with no recharge; and a groundwater availability analysis providing potential availability in a one-in-ten year drought.

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[15] DEP Document No. 394-2125-001, pertains to public water supplies but details the contents of a hydrogeologic report. The process it describes includes a stepped-rate test, a background test, a constant-rate aquifer test and a recovery test. It also includes water quality testing for temperature, pH, conductivity, and turbidity.

[16] This language is taken from the ordinance adopted by Penn Forest Township, Carbon County.

[17] Hydraulic conductivity measures the ease with which water can move through the aquifer. Transmissivity is the rate at which the aquifer can horizontally transmit water. Both essentially measure how well the aquifer can transmit water. Specific capacity is the rate of discharge from a well per unit of drawdown. The storage coefficient is the volume of water an aquifer releases from storage per unit surface area of the aquifer per unit change in head

d. Test results from any wells tested in accordance with Section G, below

e. A determination of the effects of the proposed withdrawal on the quantity and quality of water in wells, surface waters, and the groundwater table within the horizontal extent of the cone of depression and how those impacts will be mitigated or remediated.

6. **Surface water withdrawals.** SEE SUPPLEMENTARY SHEET AT THE END OF THIS DOCUMENT [18]

G. **Water Supply – Pre-construction well testing**

1. If the use is to rely upon a nonpublic groundwater source and will withdraw and/or discharge 50,000 gallons per day (gpd)[19] or more over any consecutive 30-day period, the applicant shall notify each property owner within 3,000 feet of the **property** boundary or within the horizontal extent of the any production well's cone of depression, as determined by the hydrogeologic study, whichever is greater, of the proposed project and shall offer to test the owner's well for baseline water quality, total depth of the well, static water level and operating pumping water level.

2. If the property owner grants permission to allow for water quality and well testing, the applicant shall hire and pay the full cost of a certified lab and professional geologist with a focus on hydrogeology to collect the laboratory samples and well information. Alternatively, the property owner may elect to hire a certified lab and professional geologist of his own choosing to collect the laboratory samples and well information, in which case the applicant shall pay the full cost of such services.

3. Notifications shall be sent via certified mail, shall include the name and contact information of the person to whom to respond, and shall allow sufficient time for property owners to respond and for testing to be conducted prior to commencement of the constant-rate aquifer test.

4. The applicant shall include all test results obtained pursuant to this section in the water feasibility study.

H. **Water Supply – Post-construction monitoring and reporting**

1. For purposes of this section, area of influence (AOI) shall mean the greater of the horizontal extent of the production well(s)' cone of depression, as determined by the hydrogeologic report, or the area within 3,000 feet of the property boundary of the proposed project, or, in the case of an assemblage of parcels, within 3,000 feet of the exterior lines of the assemblage of parcels.

2. **Groundwater monitoring plan.**[20] The applicant shall submit a Groundwater Monitoring Plan prepared by a professional licensed hydrogeologist with expertise

[18] Penn Future has devised surface water withdrawal provisions specific to each of Pennsylvania's major river basins based on The Nature Conservancy's Ecosystem Flow Recommendations. They are included in a supplemental section at the end of this document. Municipalities should incorporate the relevant river basin standard and omit the others.
[19] This threshold should match the threshold that triggers the need for a feasibility study.
[20] Language in this section is based in part on 25 Pa. Code § 89.34, 25 Pa. Code § 273.282, 25 Pa. Code § 110.501, and wetland monitoring conditions incorporated into certain NPDES permits.

in groundwater resource planning and management or another qualified professional or professionals approved by the Borough. The Groundwater Monitoring Plan shall include:

a. An inventory of existing wells, springs, and other groundwater resources within the AOI, including information on the location, ownership, depth to water, and usage for all wells;

b. Description of a groundwater monitoring system that ensures accurate characterization of groundwater flow, groundwater quantity and quality, and flow systems within the AOI. The system shall consist of the following at a minimum:

   i. At least one monitoring well at a point hydraulically upgradient from the point(s) of withdrawal in the direction of increasing static head that is capable of providing representative data of groundwater not affected by the facility, except when the facility occupies the most upgradient position in the flow system. In that case, sufficient downgradient monitoring wells shall be placed to determine the extent of adverse effects on groundwater from the facility; and

   ii. At least three monitoring wells at points hydraulically downgradient in the direction of decreasing static head from the point(s) of withdrawal.

c. Benchmark data collected prior to commencement of water withdrawal against which the impact of the water withdrawal may be compared in the future. Benchmark data shall include groundwater levels in all monitoring wells recorded as a distance from the elevation at the well head referenced to mean sea level based on United States Geological Survey datum.

d. Any additional information the Borough deems necessary to effectively assess the impact of the proposed development on groundwater supplies.

3. **Inspection of wells.** The Data Center Operator shall inspect monitoring wells, including water level loggers, at least monthly to ensure that they are not damaged and are functioning properly. If a damaged or malfunctioning well is identified, the Borough shall be contacted immediately in writing, and the well shall be restored to its design specifications within two weeks, unless weather conditions do not permit and/or this period is extended in writing by the Borough. In the event that the water table falls below the bottom of a monitoring well and the water level logger in that well becomes inoperable, the well shall be inspected at a minimum of once every two weeks and the data logger shall be re-installed once the water table is again observed in the well.

4. **Reporting.** The Data Center Operator shall submit to the Borough quarterly reports on forms and in a manner prescribed by the Borough. Reports shall include the following:

a. The quantity of all withdrawals, measured by means of a continuous-recording device, flow meter, or other method accurate to within 5% of actual flow, on a daily basis or such other frequency as may be approved by the Borough;

b. Groundwater levels at all monitoring wells; measured on a daily basis or such other frequency as may be approved by the Borough;

c. Precipitation data, measured on a daily basis or such other frequency as may be approved by the Borough;

d. Certification of the accuracy of all measuring devices and methods to within 5% of actual flow;

e. Any loss of measuring or recording capabilities that occurred during the reporting period;

f. A running comparison of monitoring data comparing the data for the recording period to the data for the same period in each of the previous five years;

g. Any additional information the Borough deems necessary to determine whether the data center's water withdrawal adversely impacts water supply.

I. **Adverse Groundwater Impacts; Presumptions; Hearing**[21]

1. **Adverse Impacts.** The Data Center shall not cause an adverse impact to the water rights or water supply of others, including, but not limited to, by reducing the existing rate of flow of wells, causing contamination of wells, or depleting surface water resources of surrounding properties.

2. **Process for Complaints.**

   a. Any owner of a well or other person who believes a Data Center in the Borough has caused an adverse impact to such person's water rights or water supply may file a complaint in writing with the Borough on a form prescribed by the Borough.

   b. Upon receiving a complaint pursuant to paragraph (a), the Borough shall notify the Data Center Operator in writing within five (5) business days.

   c. Within 60 days from the date of receipt of the complaint, the Borough shall decide whether the Data Center has caused the alleged adverse impact unless the complainant has agreed in writing to an extension of time or a hearing has been requested pursuant to paragraph (e), in which case the timelines set forth in paragraph (4) shall govern.

3. **Presumptions; burdens.** The following presumptions shall apply to the [municipality's] decision:

   a. A Data Center Operator shall be presumed to be responsible for any adverse impacts to any water supply well within the AIO that occurs within 60 months

[21] These provisions are based on the Jim Thorpe Borough, Carbon County, Code of Ordinances § 500-112, and the Buckingham Township, Bucks County, Well Ordinance (No. 2003-06).

following the date any production well is put into full production and shall have the burden of proving otherwise.

b. The Data Center Operator shall not be presumed to be responsible for any adverse impact to any well that is located outside the AIO or which takes place more than 60 months from the date the well or wells are put into full production. In such cases, any person claiming adverse impacts shall have the burden of proving said adverse impacts and that they are caused by the data center's withdrawal.

4. **Hearing.**

a. A Data Center Operator who asserts that an alleged adverse impact is not caused by the Data Center's well(s), any owner of a well outside the AIO who alleges an adverse water supply impact, and any owner of a well within the AIO who alleges an adverse impact more than 60 months from the date the data center's well or wells are put into full production, may request a hearing to be held before the Borough Council pursuant to the Pennsylvania Local Agency Law, 2 Pa. C.S.A. § 551, et seq., to overcome the presumption(s) set forth in Paragraph 3 by offering such evidence as they believe rebuts the presumption(s).

b. If the complainant requests a hearing, such request shall be made at the time of the filing of the complaint. If the the Data Center Operator alleged to have caused the adverse impact requests a hearing, the request shall be made within 30 days of the mailing of the notice required by paragraph 2(b). The hearing request shall include proof of service thereof on either the Data Center Operator or upon the complainant, as the case may be.

c. The Borough Council shall schedule and conduct a hearing and make a decision in accordance with, and pursuant to the timeline set forth in, Section 908 of the Pennsylvania Municipalities Planning Code, 53 P.S. § 10908,[22] except references therein to the zoning hearing board shall be construed as references to the Borough Council.

5. **Decision.**

a. The Borough Council shall decide, based on presumptions set forth in Paragraph 3, and the testimony and evidence presented at any hearing conducted pursuant to Paragraph 4, whether the Data Center has caused the alleged adverse impact.

b. Each decision shall be accompanied by written findings of fact and conclusions based thereon, together with the reasons therefor. Conclusions based on any provisions of any ordinance, rule or regulation shall contain a reference to the

[22] Alternatively, this provision can cross-reference existing local ordinance provisions governing hearings, so long as such provisions include adequate information about notice, the timing of the hearing, party status, and a timeline for decision-making.

provision relied on and the reasons why the conclusion is deemed appropriate in the light of the facts found.

6. **Remediation.** In the event that the Borough Council determines pursuant to the provisions of this Section that a Data Center is responsible for an adverse impact to the water supply of others, the Data Center Operator shall alleviate the adverse impact, at no expense to the affected property owner(s), so as to furnish reasonable quantity and quality of water. Remediation may include deepening the impacted well, drilling a new well, connecting the affected property to a public water supply, or any other measures as the Borough may approve as just and equitable under the individual circumstances.

J. **Enforcement**

1. In the event that that the Data Center Operator does not commence to remedy the adversely impacted water supply within [5] days of when the Borough Council finally determines that the Data Center Operator is responsible for an adverse impact, the Borough may draw down the financial security posted pursuant to this Section and apply such security as the Borough deems necessary to cure the problem. In the event that the financial security is not sufficient to cure the problem, the Data Center Operator shall be responsible for any additional expense, including legal, engineering and administrative costs, which are incurred in curing the problem.
2. The Borough may at its option, in addition to any other remedies available to it, institute an action in equity to enjoin, or any other appropriate action or proceedings, to restrain or prevent any violation of the provisions of this Section.

K. **Financial Security**

1. The Applicant shall deposit with the Borough at the time of land development approval financial security in an amount determined by multiplying $5,000 [23]by the number of all other groundwater wells within the Hydrologic Environment. The security shall be in the form of a term bond or the deposit of funds in escrow or a federal- or commonwealth-chartered lending institution irrevocable letter of credit and restrictive or escrow accounts.
2. Sixty (60) months after the date that the Data Center Operator's well(s) reaches full production, the Borough shall return to the Applicant all financial security posted pursuant to this Section upon written request, except such security as may be necessary to remedy any pending claims of adversely impacted wells which have not been finally determined.

L. **Power Supply**

1. If the applicant proposes to connect the Data Center to the electric grid, the applicant shall provide documentation from the applicable electric service provider certifying that that the necessary capacity is available and that electric service

[23] This number may be adjusted to reflect an appropriate cost to remedy adverse impacts to wells.

provider will serve the Data Center. Known impacts on electric rates or availability for other uses directly attributable to the Data Center project shall be noted.

2. Any energy generation system designed or used to supply power directly to a Data Center during normal operations, including solar, wind, fossil fuel, or nuclear energy generating systems, shall not be considered part of the Data Center use. Such systems shall be considered a separate use and shall be approved according to the zoning regulations applicable to such use.

M. **Emergency Management**

1. The applicant shall submit an Emergency Response Plan (ERP) prepared by a qualified professional. The ERP shall:
    a. Be reviewed and accepted by the local fire department and emergency management services as part of the [conditional use/special exception/land development] process;
    b. Include detailed procedures for fire suppression, containment, ventilation, and evacuation;
    c. Include an evaluation of the access roads and hydrant locations within the site to ensure suitable access for emergency equipment within the site;
    d. Ensure that all first responders receive adequate training specific to the installed system;
    e. Include provisions for annual fire safety inspections demonstrating compliance with fire safety standards to be performed by a qualified professional on behalf of the Data Center.
2. Any Data Center use proposing battery storage or any other device or group of devices capable of storing energy in order to supply electrical energy at a later time, whether the energy is stored for use on-site or off-site, shall demonstrate compliance with National Fire Protection Association (NFPA) Standard 855, Installation of Stationary Energy Storage Systems, or similar standards and must include fire suppression systems designed specifically for battery storage.
3. No Data Center shall be approved unless the applicant demonstrates that procedures for fire suppression, containment, ventilation, and evacuation are sufficiently protective of public health, safety and welfare.

N. **Aesthetics**

1. Any Data Center and Data Center Accessory Use building façade that faces a road, the R1, R2, R3, CMX, or JC Zoning District, or an existing residential use must incorporate at least two of the following design elements every 150 horizontal feet:
    a. A change in building material, pattern, texture, or color;
    b. A change in building height;
    c. Building step-backs or recesses having a minimum depth of five (5) feet;

O. **Parking**

1. Data Centers are to be provided with at least one parking space per 8,000 square feet of floor area designed and intended to be accessible regularly by employees, or one parking space for every one employee, based upon the maximum number of employees on site during the largest shift, whichever is lesser.

Section 4: Severability. If any sentence, clause, section, or part of this Ordinance or of the Zoning Ordinance is for any reason found to be unconstitutional, illegal or invalid, such unconstitutionality, illegality or invalidity shall not affect or impair any of the remaining provisions, sentences, clauses, sections, or parts hereof. It is hereby declared as the intent of the [GOVERNING BODY] that this Ordinance and the Zoning Ordinance would have been adopted had such unconstitutional, illegal or invalid sentence, clause, section or part thereof not been included herein.

Section 5. Repealer. All Ordinances or parts of Ordinances conflicting with any provision of this Ordinance are hereby repealed insofar as the same affects this Ordinance.

Section 6. Codification. Pursuant to the [APPPLICABLE MUNICIPAL CODE] and the Pennsylvania Municipalities Planning Code, the [MUNICIPALITY] Zoning Ordinance shall hereby be codified to incorporate the above-referenced amendments.

Section 7. Effective Date. This Ordinance shall take effect five (5) days after its adoption.

e. For surface water sources, the water feasibility study shall demonstrate that withdrawals will comply with the standards set forth in Table 1:

Table 1			
Parameter	**Drainage area of stream at point of withdrawal**		
	<10 sq. mi.	**10–200 sq. mi**	**> 200 sq. mile**
Floods	Maintain magnitude and frequency of 20-year, 5-year, and 2-year floods		
Monthly high flow	No greater than 10% change in magnitude in any month		
Monthly median flow	No change	No greater than 10% change in magnitude in any month	
Monthly low flow	No change	No greater than 10% change in magnitude in any month	
Upper monthly flow range	No greater than 20% change in magnitude in any month		
Middle monthly flow range	No change	No greater than 10% change in magnitude in any month	No greater than 15% change in magnitude in any month
Lower monthly flow range	No change	No greater than 10% change in magnitude in any month	

1. Terms used in Table 1 shall have the following meanings:
   i. **20-year flood**: Peak streamflow level having a 5% chance of occurrence in any given year
   ii. **5-year flood:** Peak streamflow level having a 20% chance of occurrence in any given year
   iii. **2-year flood:** Peak streamflow level having a 50% chance of occurrence in any given year
   iv. **Percent exceedance value.** The probability that a given flow will be equaled or exceeded in the stream at the point of withdrawal within a given month, expressed as Px. For example, the probability that the P75 flow for a given month will be exceeded at some point during the month is 75%.
   v. **Monthly flow duration curve**: a cumulative curve showing percent exceedance values for flows over a calendar month
   vi. **Monthly high flow:** flow having a percent exceedance value of P10
   vii. **Monthly median flow:** flow having a percent exceedance value of P50
   viii. **Monthly low flow:** For streams with drainage areas less than 10 miles, flow

having a percent exceedance value of P75, for all other streams, flow having a percent exceedance value of P90

ix. **Upper monthly flow range:** The area under the stream's monthly flow duration curve between P10 and P50

x. **Middle monthly flow range:** The area under the stream's monthly flow duration curve between P50 and P75

xi. **Lower monthly flow range:** The area under the stream's monthly flow duration curve between P75 and P99

2. **Baseline streamflow calculation**.[25] Baseline streamflow statistics and flow duration curves shall be calculated using generally accepted methodology based on a minimum of ten (10) recent years of record, with representative wet, normal, and dry periods sufficiently represented.

3. **Use of reference stream gage.** Where data does not exist for the location from which withdrawal is proposed, data from an appropriate USGS reference stream gage shall be used to calculate baseline flow statistics. The reference stream shall be unregulated and of a similar drainage area size, physiographic province and geology, and mean annual precipitation and evapotranspiration, and ideally located on the same stream or on a nearby stream. Best professional judgment shall be used in selecting a reference stream that best represents the project site. Flow statistics from the reference gage shall be transferred to the project site using the drainage area ratio method.

4. **De minimis withdrawals**. An applicant is exempt from the requirement to demonstrate compliance with Table 1 if the feasibility study demonstrates that withdrawals will be *de minimis*. A withdrawal is *de minimis* if it does not exceed 5% of P95 for any calendar month for streams having a drainage between 10 and 1,000 square miles at the point of withdrawal or 10% of P95 for any calendar month for streams having a drainage area greater than or equal to 1,000 square miles at the point of withdrawal. No withdrawal shall be considered *de minimis* for streams having a drainage area less than 10 square miles at the point of withdrawal.

[25] Susquehanna River Basin Commission, TECHNICAL GUIDANCE FOR LOW FLOW PROTECTION RELATED TO WITHDRAWAL APPROVALS UNDER POLICY NO. 2012-11 at 6–7 (2012).

OTHER RIVER BASINS[28]

e. For surface water sources classified by PADEP as Exceptional Value (EV), High Quality (HQ) or Cold Water Fishes (CWF), the water feasibility study shall demonstrate using the Pennsylvania-Maryland Instream Flow Study (PA-MD IFS) model that withdrawals will not cause habitat loss in excess of the following:

   1. For Exceptional Value and High Quality streams, withdrawal shall not cause annual instream habitat loss greater than 5%
   2. For streams classified as Cold Water Fishes and as Class B wild trout streams by the PA Fish and Boat Commission, withdrawal shall not cause annual instream habitat loss greater than 10%
   3. For streams classified as Cold Water Fishes and as Class C or D wild trout streams by the PA Fish and Boat Commission, , withdrawal shall not cause instream annual habitat loss greater than 15%
   4. In no case shall passby flow in any stream be less than the lowest seven-day average flow that occurs on average once every ten years ($Q_{7\text{-}10}$) at the point of withdrawal
   5. For surface water sources classified by PADEP as Warm Water Fishes (WWF), the water feasibility study shall demonstrate that passby flow shall meet or exceed 20% of annual average daily flow (ADF) for the surface water or the lowest seven-day average flow that occurs on average once every ten years (Q7-10) at the point of withdrawal, whichever is higher.

[28] This provision is appropriate for streams with drainage areas of less than 100 miles that are designated as Cold Water Fisheries, Hiqh Quality, or Exceptional Value and are located in the river basins not covered by the provisions above.