GREEN OAK CHARTER TOWNSHIP
ORDINANCE NUMBER 04-2010

AN ORDINANCE TO AMEND IN ITS ENTIRETY AND REPLACE CHAPTER 10, ARTICLE IV,
TO THE CODE OF ORDINANCES OF GREEN OAK CHARTER TOWNSHIP, TOWNSHIP
ANTI-NOISE ORDINANCE, TO ESTABLISH STANDARDS THAT WILL ELIMINATE AND
REDUCE UNNECESSARY COMMUNITY NOISES; TO PROVIDE FOR ADMINISTRATION OF
THIS ORDINANCE, AND TO PROVIDE PENALTIES FOR VIOLATIONS THEREOF.

GREEN OAK CHARTER TOWNSHIP ORDAINS:

Section 1. Title

This Ordinance shall be known and cited as the Township Anti-Noise Ordinance.

Section 2. Ordinance

The Ordinance shall be amended in its entirety to read as follows:

I. PURPOSE

This chapter is enacted to protect, preserve and promote the health, safety, welfare,
peace and quiet for the citizens of the Township through the reduction, control and prevention of
noise. It is the intent of this chapter to establish standards that will eliminate and reduce
unnecessary and excessive community noises from motor vehicles, industrial, commercial and
residential properties etc. These noises are physically harmful and otherwise detrimental to
individuals and the community in the enjoyment of life, property and conduct of business.

II. DEFINITIONS

A. Ambient sound level shall mean the A-weighted sound level of all sound
associated with a given environment, exceeded ninety (90) percent of the time
(L90) measured with a sound level meter set to the fast time weighting and being
a composite of sounds from many sources during the period of observation,
which shall be at least 10 minutes, and shall be while the sound from the noise
source of interest is not present.

B. A-weighted sound level shall mean the sound pressure level as measured with
a sound level meter using the A-weighting network. The standard notation is
dB(A).

C. Commercial property shall mean any land parcel with buildings where the use
of less than fifty (50) percent of the gross floor area meets the definition of
residential property as contained in subsection (Y). Commercial property would
include those uses permitted as of right or by special approval in the CB, GB, HC
and RO districts as set forth in Chapter 38 of the Code of Ordinance, Zoning
Ordinance.
D. **Commercial use** means the use of property in connection with the purchase, sale, barter, display or exchange of goods, wares, merchandise or personal services.

E. **Decibel** shall mean a logarithmic unit of measure often used in measuring magnitudes of sound. The symbol is dB.

F. **Dwelling unit** means any building, or portion thereof, having cooking facilities, which is occupied wholly as the home, residence or sleeping place of one family, either permanently or transiently, but in no case shall a travel trailer, motor home, mobile home, trailer coach, automobile chassis, tent or other portable building be considered a dwelling in single-family, multiple-family or two-family residential areas. In cases of mixed occupancy where a building is occupied in part as a dwelling unit, the part so occupied shall be deemed a dwelling unit, and shall comply with the provisions of this chapter relative to dwellings.

G. **Emergency vehicle** shall mean an authorized motor vehicle that has audible warning devices such as whistles, sirens and bells which can lawfully be used when responding to an emergency, or during a police, fire or medical activity or which is required by state or federal regulations (e.g., train horn).

H. **Emergency work** shall mean activity made necessary to restore property to a safe condition following a public calamity or work required to protect persons or property from exposure to imminent danger. It includes work by private or public entities for providing or restoring immediately necessary service as well as all situations deemed necessary by the township.

I. **Emergency power generator** shall mean the equipment used to generate electrical power in the event of an interruption, malfunction or failure of the electrical power supplied by the service provider.

J. **Impulsive sound** shall mean sound characterized by brief excursions of sound pressure (acoustic impulses) that significantly exceed the ambient environmental sound pressure. The duration of a single impulsive sound is usually less than one second.

K. **Industrial property** shall mean any premise where manufacturing, processing or fabrication of goods or products takes place. Industrial property would include those uses permitted as of right or by special approval in the LI and GI districts as set forth in Chapter 38 of the Code of Ordinance, Zoning Ordinance.

L. **Motor vehicle** shall mean any vehicle which is self-propelled, and is used primarily for transporting persons or property.

M. **Muffler** shall mean an apparatus consisting of a series of chambers, baffle plates or other mechanical devices designed for the purpose of receiving and transmitting exhaust gases and which reduce sound emanating from such an apparatus by at least fifteen (15) decibels when measured using the A-weighting network dB(A), from the non-muffled condition.
N. **Noise** shall mean sound that is unwanted and which causes or tends to cause adverse psychological or physiological effects on human beings. The definition of noise shall include sound for which the sound level is in excess of the limits herein (Section IV (B) or IV(C) or are prohibited by Section (IV) (D) or IV (E).

O. **Octave** means any two frequencies whose ratio is exactly two to one.

P. **Octave bands** shall mean a spectrum of sound frequencies between band edge frequencies of an octave apart. The band center frequencies shall be: 31.5 Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1000 Hz, 2000 Hz, 4000 Hz, and 8000 Hz.

Q. **Off-road motor vehicle** shall mean any motor vehicle that can be operated cross-country without benefit of a road or trail, over land, snow and other natural terrain and includes all of the following: Multi-track and multi-wheeled vehicles, ATVs, motorcycles and related 2, 3, and 4-wheeled vehicles, amphibious machines, hovercraft, and any other vehicles that use mechanical power, including 2 and 4-wheel drive vehicles that are highway registered, when said vehicles are operated off road. NOTE: This definition is from the Michigan DNR and specifically does NOT include snowmobiles; farm, construction, and logging vehicles when being used in normal work practices; military, fire, emergency, and law enforcement vehicles.

R. **On-road motor vehicle** shall mean any motor vehicle which is used upon public roadways and required to be licensed according to motor vehicle registration laws. The term motor vehicle shall not include: aircraft, watercraft, motor vehicles operated on private property for recreational or amusement purposes, vehicles used exclusively on stationary rails, or specialized utility vehicles normally used only on private property in the daily course of business such as forklifts, and pallet movers.

S. **Ordinance Enforcement Official** means the person or persons designated by the Green Oak Charter Township Board to enforce this ordinance.

T. **Person** shall mean any person, firm, association, organization, partnership, business, trust, corporation, company, contractor, supplier, installer, user or owner; and shall include any municipal corporation, state or federal governmental agency, district, or any officer or employee thereof.

U. **Plainly audible** shall mean any sound that can be detected by a person using his or her unaided hearing faculties. As an example, if the sound source under investigation is a portable or vehicular sound amplification or reproduction device, the detection of the rhythmic bass component of the music is sufficient to verify plainly audible sound. The noise control officer need not determine the title, specific words, or the artist performing the song.

V. **Power equipment** shall mean any device or mechanical apparatus operated by fuel, electric, or pneumatic power in the excavation, construction, repair, or demolition of any building, structure, land parcel, street, alley, waterway, or appurtenance thereto, excluding snow removal equipment.
W. **Premises** shall mean any building, structure, land, utility or portion thereof, including all appurtenances, and shall also include yards, lots, courts, inner yards and real properties without buildings or improvements, owned or controlled by a person.

X. **Prominent Discreet Tone** shall be identified as present when the equivalent-continuous sound pressure level in any one-third octave band exceeds the average equivalent-continuous sound pressure level for the two adjacent one-third octave bands by 15 dB for the one-third octave bands between 25 and 125 Hz inclusive, by 8 dB for the one-third octave bands between 160 and 400 Hz inclusive, and by 5 dB for the one-third octave bands between 500 and 10,000 Hz inclusive.

Y. **Property line** shall mean that real or imaginary line and its vertical extension which separates real property owned or controlled by any person from contiguous real property owned or controlled by another person. The vertical and horizontal boundaries of a dwelling unit in a multi-dwelling-unit building, condominium, or townhouse complex shall not be considered property lines separating one (1) premise from another.

Z. **Public Land** shall include land that is primarily designated for use by the public such as natural areas, unimproved of undeveloped open spaces, public buildings or public activities. Public land uses would include those uses permitted as of right or by special approval in the PL district as set forth in Chapter 38 of the Code of Ordinance, Zoning Ordinance.

AA. **Receiving property** shall mean the premises (residential, commercial, industrial, or public) as listed in Tables I or II which is receiving noise emitted from the source premises after crossing one (1) or more property lines.

BB. **Residential property** shall mean any premises where single or multiple dwelling units exist including any commercial premises where the use of more than fifty (50) percent of the gross floor area meets this definition of residential property. Residential property would include those uses permitted as of right or by special approval in the RF, RE, R1, R2, R3, RZA, RM and RMH districts as set forth in Chapter 38 of the Code of Ordinance, Zoning Ordinance.

CC. **Rounding** shall mean that if the fractional part of the measured level is 0.5 dB or greater, then the reported number becomes the next whole integer, or if the fractional part is less than 0.5 dB, then the reported number remains the existing whole integer.

DD. **Sound** shall mean an oscillation in pressure, stress, particle displacement or particle velocity which induces auditory sensation.

EE. **Sound level meter** shall mean an apparatus or instrument including a microphone, amplifier, attenuator, output meter and frequency weighting networks for the measurement of sound levels. The sound level meter shall be of a design and have the characteristics of a Type 2 or better instrument as established by the American National Standards Institute, publication ANSI S1.4-1983 (R2006) American National Standard Specification for Sound Level Meters,
and shall be capable of measuring L90 using fast time weighting in addition to measuring sound pressure level. For measurement of octave-band or one-third-octave-band spectra, the sound level meter shall have filters meeting at least the Class 2 requirements of ANSI S1.11-2004 (R2009) American National Standard Specification for Octave-Band and Fractional-Octave-Band Analog and Digital Filters.

FF. Sound pressure level shall mean twenty (20) times the logarithm to the base ten (10) of the ratio of the pressure of a sound to the reference pressure of twenty (20) microwatts per square meter (20 X 10^{-8} Newtons/meter²), and is expressed in decibels (dB). Alternate: Sound pressure level shall be the level measured by a sound level meter and as defined in ANSI S 1.13.

GG. Source property shall mean the premises (residential, commercial, industrial, or public) as listed in Table I or II that is emitting noise that is crossing one (1) or more property lines and impacting the receiving property.

HH. Snow removal equipment shall mean any equipment used for removing snow from land or building surfaces and shall include snow plows, snow blowers, snow sweepers, and snow shovels.

II. Tree maintenance equipment shall mean any equipment used in trimming or removing trees only and shall not be limited to chainsaws, chippers and stump removers.

III. REGULATIONS

A. General Prohibition of Noise

No person, firm, corporation or other legal entity shall cause or create any unreasonable or unnecessarily loud noise or disturbance, injurious to the health, peace or quiet of persons within the Township.

B. Numerical Property Line Noise Limits

No person shall emit or cause to be emitted any sound which leaves the premises on which it originates, crosses one (1) or more property lines, and enters onto any other premise, resulting in a sound pressure level or levels in excess of those permitted by Tables I or II.

(1) Table I shall apply to all sound sources.

(2) Table II also shall apply to constant sound sources such as fans, blowers, and compressors, which may or may not cycle between levels, or on and off.

(3) When it is determined that the ambient sound level at the receiving premises equals or exceeds the maximum allowable sound pressure level specified in Table I, then the ambient sound level plus 3 dB is the standard which cannot be exceeded by the source.
(4) When it is determined that the received sound contains a prominent
discrete tone, then the limits in Tables I and II all shall be reduced by 5 dB
for all receiving property categories except for the industrial receiving
property category.

Table I. Maximum permissible A-weighted sound levels

<table>
<thead>
<tr>
<th>Receiving Property Category</th>
<th>Residential property</th>
<th>Schools, houses of worship, public service facility, community service facility, or similar uses</th>
<th>Commercial property and non-residential portion of a multi-use property</th>
<th>Industrial Property</th>
<th>Public Land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7am to 10pm</td>
<td>60</td>
<td>24 hours</td>
<td>24 hours</td>
<td>24 hours</td>
<td>24 hours</td>
</tr>
<tr>
<td>10pm to 7am</td>
<td>50</td>
<td>24 hours</td>
<td>24 hours</td>
<td>24 hours</td>
<td>24 hours</td>
</tr>
<tr>
<td>Maximum A-weighted, fast sound level, dB</td>
<td>60</td>
<td>70</td>
<td>75</td>
<td></td>
<td>75</td>
</tr>
</tbody>
</table>

Table II. Maximum permissible Octave Band sound pressure levels, dB

<table>
<thead>
<tr>
<th>Receiving Property Category</th>
<th>Residential property</th>
<th>Schools, houses of worship, public service facility, community service facility, or similar uses</th>
<th>Commercial property and non-residential portion of a multi-use property</th>
<th>Industrial Property</th>
<th>Public Land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Octave-Band center-frequency, Hz</td>
<td>Octave-Band sound pressure level, dB 7am to 10pm</td>
<td>Octave-Band sound pressure level, dB 10pm to 7am</td>
<td>Octave-Band sound pressure level, dB 24 hours</td>
<td>Octave-Band sound pressure level, dB 24 hours</td>
<td>Octave-Band sound pressure level, dB 24 hours</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>---------------------------------------------</td>
<td>---------------------------------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>Time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31.5</td>
<td>75</td>
<td>75</td>
<td>75</td>
<td>80</td>
<td>85</td>
</tr>
<tr>
<td>63</td>
<td>75</td>
<td>71</td>
<td>75</td>
<td>80</td>
<td>85</td>
</tr>
<tr>
<td>125</td>
<td>71</td>
<td>61</td>
<td>71</td>
<td>80</td>
<td>85</td>
</tr>
<tr>
<td>250</td>
<td>64</td>
<td>54</td>
<td>64</td>
<td>74</td>
<td>79</td>
</tr>
<tr>
<td>500</td>
<td>58</td>
<td>48</td>
<td>58</td>
<td>68</td>
<td>73</td>
</tr>
<tr>
<td>1000</td>
<td>55</td>
<td>45</td>
<td>55</td>
<td>65</td>
<td>70</td>
</tr>
<tr>
<td>2000</td>
<td>52</td>
<td>42</td>
<td>52</td>
<td>62</td>
<td>67</td>
</tr>
<tr>
<td>4000</td>
<td>50</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>65</td>
</tr>
<tr>
<td>8000</td>
<td>48</td>
<td>38</td>
<td>48</td>
<td>58</td>
<td>63</td>
</tr>
</tbody>
</table>

Note: Exceedance of any one or more octave band limits for the receiving category in question shall constitute a violation of this chapter.

C. **Motor Vehicle noise limits**

1. **On-road limits.**

No person shall operate a motor drive vehicle on public roads so as to exceed the limits in Table III at or beyond 50 ft from the vehicle.

**Table III. On-Road Motor Vehicle Sound Level Limits**

<table>
<thead>
<tr>
<th>Vehicle</th>
<th>Weight</th>
<th>dB(A) Maximum limitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trucks &amp; buses</td>
<td>Over 10,000 lbs. gross weight</td>
<td>82 dB(A)</td>
</tr>
<tr>
<td>Trucks &amp; buses</td>
<td>Under 10,000 lbs. gross weight</td>
<td>74 dB(A)</td>
</tr>
<tr>
<td>Passenger cars</td>
<td>Any weight</td>
<td>74 dB(A)</td>
</tr>
<tr>
<td>Motorcycles, &amp; minibikes</td>
<td>Any weight</td>
<td>82 dB(A)</td>
</tr>
<tr>
<td>-------------------------</td>
<td>------------</td>
<td>----------</td>
</tr>
<tr>
<td>Snowmobiles and all other self-propelled motor vehicles</td>
<td>Any weight</td>
<td>74 dB(A)</td>
</tr>
</tbody>
</table>

* All sound emitted from motor driven vehicles on public roads shall be measured at a height of 4 to 4.5 ft and whenever possible at a distance of at least 50 feet or 15 meters from a noise source located within the public right-of-way. If measurements at 50 feet (15 meters) are not feasible, measurements may be made at 25 feet (7 1/2 meters) and if this is done, six dB(A) shall be added to the limits provided in Table III.

(2) Off-road vehicle rules and sound level limits.

(a) During the hours from 8 AM to 10 PM, the maximum A-weighted fast sound level from any off-road vehicle operating off-road shall not exceed 66 dB within 30 ft of any residence, and shall not exceed 72 dB within any residential property line. During the hours from 10 PM to 8 AM all off-road vehicle sound shall not exceed the limits of Section III, Table 1.

(b) When operating off-road, off-road vehicle speeds shall be less than 10 MPH when within 200 ft of any residential property.

(c) All off-road vehicles shall comply fully with all noise and noise-related rules of the Michigan DNR.

(3) Boats and PWC rules and sound level limits.

(a) During the hours from 8 AM to 10 PM, the maximum A-weighted fast sound level from any boat or PWC shall not exceed 72 dB at the shoreline when measured in accordance with SAE J1970. During the hours from 10 PM to 8 AM all boat and PWC sound shall not exceed the limits of Section III, Table 1.

(b) All boat and PWC speeds shall be less than 5 MPH when operating within 250 ft of the shoreline.

(c) All boats and PWC shall comply fully with all noise and noise-related rules of the Michigan DNR.

(4) Snowmobile rules and sound level limits.

(a) During the hours from 8 AM to 10 PM, the maximum A-weighted fast sound level from any snowmobile operating off-road shall not exceed 70 dB within 30 ft of any residence. During the hours from 10 PM to 8 AM all snowmobile sound shall not exceed the limits of Section III, Table 1.

(b) When operating off-road, snowmobile speeds shall be less than 10 MPH when within 150 ft of any residence.
(c) All off-road vehicles shall comply fully with all noise and noise-related rules of the Michigan DNR.

D. **Prohibited Noises**

Notwithstanding the provisions of Tables I and II, the following standards shall apply to the sources of sound set forth below:

1. **Power equipment**

No person, excluding emergency work, shall operate power tools, landscaping, or yard maintenance equipment between the hours of 10:00 p.m. and 7:00 a.m. on weekdays or between the hours of 10:00 p.m. and 8:00 a.m. on weekends, from any category of property, that exceed the sound level limits set forth in Tables I or II. All motorized equipment used in these activities shall be operated with a muffler. At all other times, the sound level limits set forth in Tables I or II do not apply to power tools, landscaping, tree maintenance or yard maintenance equipment.

2. **Compacting and trash, compost, and recycling collection.**

No person shall operate any trash compacting mechanism on any motor vehicle or on any premises, nor shall any person engage in any trash, rubbish, garbage, compost, or recycling collection activity between the hours of 10:00 p.m. and 6:00 a.m., when such compacting or collection activity takes place on any premises adjacent to or across the street or alley from a residential property.

E. **Prohibited Activities**

Notwithstanding the provisions of Tables I and II, the following standards shall apply to the activities set forth below:

1. **Snow Removal**

No person shall operate motorized snowblowers, snow throwers, or lawn equipment with attached snow plows without a muffler.

2. **Vehicle Mufflers**

No person shall modify or change the exhaust muffler, air intake muffler or any other sound reducing device in such a manner that the sound level emitted from the motor vehicle is increased above the sound pressure level of the vehicle as originally manufactured. Muffler cutouts, by-passes or other devices which increase sound pressure levels, or change the original manufactured exhaust system of any motor vehicle shall be considered a violation of this chapter.

F. **Exceptions**
All railroad yard operations shall be subject to the maximum permissible sound levels allowed in industrial districts, regardless of the zone where they are located.

IV. ENFORCEMENT

A. General Requirements

Property line based tests shall be conducted in accordance with all of the following procedures and motor vehicle based tests shall be conducted in accordance with (2), (3), and (4) below:

1. The investigator shall, to the extent practicable, identify major sources contributing sound to the point of measurement.

2. The measuring device calibration shall be checked before going to the field for measurements and shall be checked in the field before and after each series of measurements and at least hourly.

3. No outdoor measurements shall be made under any condition which allows the measuring device, especially the microphone, to become wet.

4. No outdoor measurements shall be made if the meter cannot be maintained within the range specified by the manufacture.

B. Measurements

1. For property line based measurements, the noise source shall be measured at any point along the property line or within the property line of the receiving property to determine compliance with this chapter.

2. Time-varying sounds shall be measured using the fast time-weighting. Continuous sound levels or motor vehicle sound levels shall be measured using the slow time-weighting.

3. All measurements shall be rounded to the nearest whole decibel.

4. All measurements shall be corrected for the ambient as follows:

   a) Time-varying sound

      When making measurements of time-varying sounds, the measuring official shall observe the meter rise to its maximum while he/she hears the sound rise to a maximum for the measurement to be valid.

      i) Case 1: When the difference in any given 5-minute period between the maximum level and the minimum level is 11 dB or more, then the offending sound level shall be taken to be the maximum level and no correction for the ambient is required.
(ii) **Case 2:** When the difference between the maximum level and the minimum level in any 5 minute period is between 3 and 10 dB, then the noise sound level plus the ambient shall be taken to be the maximum level. The ambient shall be determined in accordance with subsection (b) below. The maximum level, which is the noise sound level plus ambient, shall be corrected to noise sound level alone using Table IV.

(iii) **Case 3:** When the difference in any given 5-minute period between the maximum level and the minimum level is less than 3-dB, then the noise sound level is too near to the ambient and no violation is demonstrated.

(b) **Ambient sound level**

When required, the ambient sound level alone shall be determined using one of the following four methods, in hierarchical order:

(i) If possible, the noise in question should be turned off, and with the source(s) of noise off, the ambient sound level shall be measured.

(ii) If the noise source(s) cannot be turned off, then a 5-minute measurement of L90 shall be made and used as a trial correction for the ambient sound level. If after this trial correction, a violation of the limits is shown, then the measurements are complete and nothing else need be done; else, the (iii) or (iv) methods shall be used to determine the ambient sound level.

(iii) If the source(s) of noise turn off some other time of day, then with the source(s) of noise off, the ambient sound level shall be measured within 24 hours of the noise measurement. For example, for daytime measurements at a plant or factory that operates only during daytime hours, measurement of the ambient sound level might occur just before work begins, during lunch, or just after work ends. For this method of determining the ambient, 5 dB shall be added to the measured ambient levels before they are used to adjust the measured noise sound levels (that includes the ambient).

(iv) If the source(s) of noise never turn off, then the ambient sound level shall be measured at a like site, at a like day of the week, and at a like time of day. For this method of determining the ambient, 5 dB shall be added to the measured ambient levels before they are used to adjust the measured noise sound levels (that includes the ambient).
Table IV. Correction in dB that shall be subtracted from the noise sound level plus ambient sound level measurement so that the result is just the sound level of the noise in question (See Note 1 below).

<table>
<thead>
<tr>
<th>Δ, difference (dB)</th>
<th>&lt; 3</th>
<th>3 - 4</th>
<th>5 - 6</th>
<th>7 - 10</th>
<th>&gt;10</th>
</tr>
</thead>
<tbody>
<tr>
<td>K, correction (dB)</td>
<td>Note 2</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Notes:

1. This table provides a simple correction to measurements that are affected by ambient sound. For example, the sound of an industrial fan, along with the ambient sound which is always present, is measured as 65 dB (A) and the ambient sound level alone (without the fan) is measured as 59 dB (A). Then Δ, the difference in decibels is 6 dB (first row, third column), and the corresponding correction is 2 dB (second row, third column). That is, 2 dB are subtracted from the measured 65 dB (A) level, and it is adjusted to and reported as 63 dB (A).

2. If the difference between the noise sound level plus ambient sound level and the ambient sound level alone is less than 3 dB, then it shall not constitute a violation of this chapter.

(c) Constant Noise

Constant noises, possibly cycling, such as the sound from fans, blowers, or compressors shall be measured, if cyclic, during the loudest cycle. This measurement is of the noise sound level plus the ambient sound level. The ambient sound level alone shall be determined using the method of subsection (b) above. The maximum level, which is the noise sound level plus ambient sound level, shall be corrected to noise sound level alone using Table IV.

(i) If it is not possible to demonstrate an exceedance of the Table I limits using the above procedure, then one may proceed to use Table II. Using Table II shall involve the exact same steps as described above for using Table I, but with the measurements being the octave band levels indicated in Table II in lieu of the A-weighted measurements indicated in Table I. The measured octave band noise sound level plus ambient sound levels shall be corrected using the methods of Table IV.

(ii) The officer shall verify that the measured sound truly is the offending sound. As he/she walks further from the offending sound source, the level(s) must fall.

(iii) If the offending noise is suspected of containing a prominent discrete tone, enforcement officials may elect to
measure a one-third-octave-band spectrum. This measurement, if conducted, will consist of the noise sound level plus the ambient level. If this measurement is conducted, then the ambient level alone shall be measured, and the noise sound level plus the ambient sound level shall be corrected to noise sound level alone using the method in Table IV. The method of ANSI/ASA S12.9-1993/Part 3 (R2008) - American National Standard Quantities and Procedures for Description and Measurement of Environmental Sound, Part 3: Short-Term Measurements with an Observer Present; Appendix C: Determination of the Presence of Prominent Discrete Tones shall be used to determine the presence of prominent discrete tones.

(d) Motor Vehicle Noise

Motor vehicle noise shall be measured in the following fashion. The enforcement official shall continually observe the sound level meter. For a valid violation, the meter shall reach a maximum that exceeds the limits in Table IV, rise from a level that was at least 7 dB below the maximum observed, and decay from the maximum level observed to a level that is at least 7 dB below the maximum. No correction for the ambient is required.

C. Equipment Requirements

(1) Sound level meter

(a) Measurements of continuous, time-varying, impulsive, or tonal sound shall be made either with a Class 1 (Precision) or a Class 2 (General Purpose) sound level meter manufactured to the requirements of ANSI S1.4-1983 (R2006) American National Standard Specification for Sound Level Meters or its successor.

(b) Measurements of sound by octave bands or one-third-octave bands shall be made with a sound level meter with fractional-octave band frequency filter set that conforms to the requirements of Class II as specified in ANSI/ASA S1.11-2004 (R2009) American National Standard Specification for Octave-Band and Fractional-Octave-Band Analog and Digital Filters or its successor.

(2) A calibrator shall be used as recommended by the manufacturer of the sound level meter.

(3) The fundamental level of the calibrator and the sensitivity of the sound level meter shall be verified annually by a laboratory using procedures traceable to the National Institute of Standards and Technology.

(4) A wind screen shall be used as recommended by the sound level meter manufacturer.
(5) An anemometer with a range of 5 to 15 miles per hour (2.2 to 6.7 meters per second) and plus or minus 2 miles per hour (plus or minus 0.9 meters per second) accuracy.

(6) A compass for measuring wind direction to at least an 8-point resolution: N, NE, E, SE, S, SW, W, NW.

D. Microphone Position

(1) For A-weighted measurements, the microphone shall be placed in one of three positions:

(a) The most preferred position is at least 15 ft from any large reflecting surface and at a height of 4-4.5 ft above ground.

(b) If (a) above is not possible, then the second choice of microphone position is to locate it up against a hard wall of the affected structure and at the height of the middle of the first floor windows. Six dB shall be subtracted from all measurements at this position.

(c) The least desirable choice for microphone position is to locate the microphone 3-6 ft from any large reflecting surface. The microphone height at this position shall be 4-4.5 ft above ground. Three dB shall be subtracted from all measurements at this position.

(2) For octave or one-third-octave-band measurements the microphone is to be located at least 30 ft from any large reflecting surface and at a height of 4-4.5 ft above ground.

E. Measurement Uncertainty

The measurement uncertainty shall be taken to be as indicated in Table V.

(1) If the limit in question in Table I or II equals or exceeds the ambient, then the appropriate value from Table V shall be added to that limit in Tables I or II and noise sound levels, after correction for the ambient, if any, that exceed the applicable limit plus the corresponding measurement uncertainty from Table V shall be deemed a violation of this regulation.

(2) If the ambient exceeds the limit in question in Table I or II, then the limit shall be the ambient plus the corresponding measurement uncertainty from Table V. Noise sound levels, after correction for the ambient sound level, that exceed this newly calculated limit shall be deemed a violation of this regulation.

<table>
<thead>
<tr>
<th>Table V. Measurement Uncertainty (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-weighted measurements at least 15 ft from large</td>
</tr>
<tr>
<td>Reflecting Surfaces</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>Type 1 meter</td>
</tr>
<tr>
<td>Type 2 meter</td>
</tr>
</tbody>
</table>

**F. Reporting requirements**

1. Reports shall be provided on forms approved by the Township.

2. The report for each test shall include:

   a. The date and day of the week on which the test is made.
   
   b. The time of the measurements.
   
   c. The times of calibration checks of the measuring devices while on site.
   
   d. The weather conditions.
   
   e. The temperature.
   
   f. The wind speed and direction.
   
   g. The identification of all measurement equipment by manufacturer, model number, and serial number.
   
   h. If applicable, the duty cycle of source of interest.
   
   i. The total sound level in dB (A), or dB if in octave bands.
   
   j. The neighborhood ambient sound level in dB(A), or dB if in octave bands, at the measurement point, except for time varying sound where the difference between the maximum and minimum in a 5 minute period is 11 dB or greater [See Section V, Paragraph B, Subsection (a), Clause (i)].
   
   k. A sketch of the site, not necessarily to scale, orienting the facility of interest, the points of measurement, topographic features, and relevant distances, containing sufficient information for another investigator to repeat the measurements under similar conditions.
   
   l. A description of the sound sources by character and location.
   
   m. A description of the neighborhood ambient sound by the character and location, to the extent feasible.
G. **Ordinance Enforcement Officials and their qualifications and training**

(1) All acoustical measurements will be made by the Ordinance Enforcement Official.

(2) Training in A-weighted sound level measurements shall be conducted for approximately one half day annually by a qualified noise control engineer, e.g., a member firm of the National Council of Acoustical Consultants (NCAC), or a member of the Institute of Noise Control Engineering of the USA who is Board Certified.

(3) Octave and One-Third Octave Band measurements shall be performed by an individual with training in the measurement of environmental noise.

V. **TEMPORARY EXEMPTIONS**

A. The Township Board is authorized to grant temporary exemption permits from the provisions of this article if such exemption would be in the public interest and there is no feasible and prudent alternative to the activity for which the exemption is sought.

B. The temporary exemption permit may not be renewed more than three times. Each permit may be granted for a period of no longer than thirty (30) days and the permit shall state the character of the event or activity, the dates and times of the proposed activity or event, the location of the proposed activity or event, and the name of the permittee.

C. Any temporary exemption permit granted pursuant to this section may be subject to, and may prescribe any conditions, limitations or requirements which the Township Board deems necessary to minimize the adverse effects upon the community, persons within the community or the surrounding neighborhood.

D. The Township may summarily revoke the exemption if such conditions, limitations or requirements are not met.

E. The following factors will be considered in determining whether to grant the exemption:

   (1) The proximity of any residence or other use which may be adversely affected.

   (2) Whether the sound is unusual or usual for the location.

   (3) The density of population of the area.

   (4) The time of day or night for which the activity or event is proposed.

   (5) The intensity, frequency and duration of the sound, including, but not limited to, whether the sound will be steady, intermittent, impulsive or repetitive.
The balancing of the hardship between the person seeking the exemption if the exemption is not granted and the hardship to others if the exemption is granted. (Ord. No. 81, § 5, 9-16-1992)

VI. VARIANCES

A. Persons wishing to continue activities which commenced prior to the enactment of the ordinance from which this article is derived and which create noises or disturbances in violation of this Chapter may seek a variance from the Township Board.

B. A variance may be granted if the Township Board finds that strict application of this Chapter would cause a hardship and that there is no reasonable and prudent alternative method of engaging in that activity.

C. Any variance granted pursuant to this section may be subject to, and may prescribe, any conditions, limitations or requirements which the Township Board deems necessary to minimize the adverse effects upon the community, persons within the community or the surrounding neighborhood.

Section 3. Penalty

Any violation of this Ordinance shall be punishable as a municipal civil infraction in accordance with Chapter 20, Article II, of the Code of Ordinances for Green Oak Charter Township.

Section 4. Repealer

This Ordinance hereby repeals any ordinances in conflict herewith.

Section 5. Severability

The various parts, sections and clauses of this Ordinance are declared to be severable. If any part, sentence, paragraph, section or clauses is adjudged unconstitutional or invalid by a court of competent jurisdiction, the remainder of the Ordinance shall not be affected.

Section 6. Savings Clause

That nothing in this Ordinance hereby adopted be construed to affect any just or legal right or remedy of any character nor shall any just or legal right or remedy of any character by lost, impaired or affected by this Ordinance.

Section 7. Publication and Effective Date

This Ordinance is hereby declared to have been adopted by the Green Oak Charter Township Board at a meeting thereof duly called and held on the eighteenth of August, 2010 and ordered to be given effect as mandated by Charter and statute.
Section 8. Adoption

This Ordinance was duly adopted by the Green Oak Charter Township Board at its regular meeting called and held on the eighteenth of August, 2010, and was ordered given publication in the manner required by law.

Michael H. Sedlak, CMC Township Clerk

Mark St. Charles Township Supervisor

Adoption Date: August 18, 2010
Publication Date: August 27, 2010
Effective Date: August 27, 2010

CERTIFICATION

I, Michael H. Sedlak, the Clerk for the Green Oak Charter Township, Livingston County, Michigan, do hereby certify that the foregoing is a true and complete copy of Ordinance Number 04-2010, adopted by the Green Oak Charter Township Board at a regular meeting held on August 18, 2010. The following members of the Township Board were present at that meeting: Susan Daugherty, Treasurer, Tracey Edry, Trustee, Richard Everett, Trustee, Rollin Green, Trustee, Wally Qualls, Trustee, Michael Sedlak, Clerk and Mark St. Charles, Supervisor.

The Ordinance was adopted by the Township Board with seven members of the Board voting in favor and no members voting in opposition. Notice of adoption and publication of the Ordinance was published in the Livingston County Daily Press & Argus on August 27, 2010. The Ordinance shall be given immediate effect upon publication.

Michael H. Sedlak, Township Clerk