

**TAB A**

**CHAPTER 4****PLANNED UNIT DEVELOPMENT AND OPEN SPACE DEVELOPMENT OPTION****SECTION 401. DESCRIPTION AND PURPOSE**

The use, area, height, bulk, and placement regulations of this Ordinance are primarily applicable to the usual situation of one (1) principal building per lot. In certain larger or unusual developments these requirements result in a less desirable development for the achievement of the purposes of this Ordinance than if a controlled degree of flexibility is allowed. For example, a large scale residential development might better achieve the purposes of this Ordinance if a portion of the open space requirements were consolidated into small community parks rather than on an individual, lot-for-lot basis.

A development may be of such large size or unusual nature as to justify permitting certain incidental uses not normally permitted in the zoning district. As an example, a multiple-family development might include a coffee shop, food store, or barber shop primarily for the residents of the development. Permitting these uses within the development can, in certain cases, increase convenience, be compatible with the overall character of the development, and not be injurious to adjoining properties.

The Planned Unit Development (PUD) Zoning District is intended to permit and control the development of preplanned areas as planned developments (PUDs) for various compatible uses permitted by this Ordinance in other zoning districts and for other special uses not so permitted. In so doing, a degree of flexibility is allowed in the use, area, height, bulk, and placement regulations for PUD developments. However, it is also the intent of a PUD district to afford each type of use reasonable protection from encroachment or interference by other incompatible land uses, and that reasonable protection be afforded to uses adjacent to the PUD zoning district.

Note that the provisions of this Charter are not intended as a device for ignoring the Zoning Ordinance or the Master Plan on which they are based. Instead, the provisions of this Chapter are intended to result in land use and development that are substantially consistent with the underlying zoning.

All zoning pursuant to this Chapter shall give due consideration to maintenance of reasonable conditions regarding emission and transmission of injurious or obnoxious noise, vibration, gas, smoke, dust, dirt, litter, odor, light glare, traffic congestion, ease of police and fire protection, drainage, lateral land support, blighting influence, effect on surrounding property values, light and air, overcrowding of persons, sanitation, surface and

groundwater quality, water supply and sewage disposal, general appearance and character of the area, and other similar considerations having an effect on the achievement of the purposes of this Ordinance.

#### **SECTION 402. REZONING REQUIRED**

The granting of a Planned Unit Development (PUD) application shall require an amendment of the Zoning Ordinance and Zoning Map, which is part of this Ordinance. An approval granted under the provision of this Chapter, including all aspects of the final site development plan and conditions imposed shall constitute an inseparable part of the Zoning Ordinance.

#### **SECTION 403. PERMITTED USES**

Land in the PUD Zoning District may be used for any use permitted by this Ordinance as a use by right except that PUD's located in residential districts shall not contain an industrial use.

#### **SECTION 404. PROCEDURES**

Any land in the Township may be zoned or rezoned as PUD Zoning District in accordance with the procedures and requirements specified in the remainder of this Chapter.

#### **SECTION 405. PRE-APPLICATION CONFERENCE**

Prior to the submission of an application for a PUD, the applicant shall meet with the Zoning Administrator, and other Township staff and/or consultants as deemed appropriate. At the pre-application conference (or conferences), the applicant shall present a sketch plan of the proposed PUD and the following information:

1. A legal description of the property in question;
2. The total number of acres to be included in the project;
3. A statement of the approximate number, type, and square footage of both residential units and non-residential units;
4. The approximate number of acres to be occupied by or devoted to each type of use;
5. Departures from the minimum underlying zoning district regulations which may be requested;
6. The number of acres to be preserved as open space or recreation space; and

7. All known natural resources and natural features on the site.

#### **SECTION 406. PRELIMINARY PLAN**

Submissions and Content: Applicants for PUD zoning district shall prepare and submit to the Zoning Administrator, three (3) copies of a preliminary plan for the PUD. The Zoning Administrator shall promptly transmit two (2) copies of this plan to the Planning Commission and one (1) copy to the Township Board. This plan shall set forth, in general terms, the proposed uses to be developed in the PUD and the following specific information.

1. A legal description of the land included in the PUD.
2. Small-scale vicinity map indicating the location of the PUD in relationship to the general area.
3. A map, to scale, showing any existing or proposed arrangement of; (1) street, (2) lots and buildings, (3) access points, (4) other transportation arrangements, and (5) buffer strips.
4. A narrative describing: (1) the overall objectives of the PUD, (2) number of acres allocated to each use, (3) gross densities, (4) proposed methods of providing sewer and water service as well as other necessary public and private utilities, and (5) proposed method of providing storm drainage.

#### **SECTION 407. PLANNING COMMISSION REVIEW OF PRELIMINARY PLAN**

The Planning Commission shall review the preliminary plan and make recommendations to the applicant based on (1) requirements of this Ordinance and (2) the standards described in Section 408.

1. Minimum Area; In order to be rezoned as a PUD, the proposed land area shall be at least ten (10) acres; provided, however, that the proposed area to be zoned as a PUD industrial park or research park shall be at least twenty (20) acres.
2. Maximum Residential Density; The density of a residential PUD shall not exceed ten (10) dwelling units per acre.
3. Minimum Single-Family Residential Floor Area; All single-family residential dwellings proposed as part of a PUD shall have a minimum floor area of 980 square feet.
4. MINIMUM OPEN SPACE REQUIREMENTS: Each PUD project must devote a minimum of ten (10) percent of the project site to permanent open space. Sites which include woodlands, wetlands, or other natural features may leave these areas in a natural state as part of the site's open space. The required open space must be

set aside for use either by all residents of the PUD or by the public at large. Yard areas of individual residential lots may not be included as part of the required open space, but yard areas for multi-family or non-residential uses may be included.

5. MINIMUM STANDARDS-UNDERLYING ZONING DISTRICTS AND WAIVER: Unless **specifically waived** by the Township Board with the recommendation of the Planning Commission, **all regulations of the underlying zoning district prior to the PUD request shall apply.** This includes regulations pertaining to lot size, lot width, yard area, structure height, setbacks, accessory uses, signs, off-street parking and loading areas, general provisions, and all other applicable regulations. In projects within an underlying residential district which contain mixed used, the most restrictive district regulations within this Ordinance under which each non-residential use would otherwise be permitted shall apply. These regulations **MAY** be waived **ONLY** if it is demonstrated by the applicant that the purposes of this Ordinance would be achieved by alternate means.
6. DESIGN CONSIDERATION: A proposed PUD shall adequately address the following design considerations. These considerations are necessary to ensure compliance with all applicable regulations, and to ensure the compatibility of the project with adjoining properties and the general area where the project is located:
- (a) Ingress and egress to the property and proposed buildings and structures thereon, with particular reference to vehicle and pedestrian safety and convenience, traffic flow and control, and access in case of fire or catastrophe.
  - (b) Off-street parking and loading areas where required, with particular reference to the items in subparagraph 1 above and the economic, noise, glare, or odor effects for each use in the proposed PUD.
  - (c) Refuse and service area, with particular reference to the item in subparagraphs 1 and 2 above.
  - (d) Utilities, with reference to locations, availability and compatibility.
  - (e) Screening and buffering with reference to type, dimension, and character.
  - (f) Signs, if any, and proposed exterior lighting, with reference to glare, traffic safety, economic effect and

- compatibility and harmony with adjoining properties and properties in a proposed PUD.
- (g) Required yards and other open spaces.
  - (h) General compatibility with adjoining properties and properties in the proposed PUD.
  - (i) General compatibility with the purposes of this Ordinance, as well as compatibility with other ordinances and statutes which regulate land development.
  - (j) General compatibility with the Township Master Plan.

**SECTION 408. (reserved for future use)**

**SECTION 409. TRANSMITTAL OF PLANNING COMMISSION'S RECOMMENDATION**

The Planning Commission shall transmit its recommendations pertaining to the preliminary plan to the applicant. A copy of the Planning Commission's recommendations shall be transmitted to the Township Board. In the course of its consideration of the preliminary plan, the Planning Commission may call an advisory public hearing and give such notice there of as it shall deem appropriate.

**SECTION 410. FINAL PLAN SUBMISSION**

1. After receiving the recommendations to the Planning Commission on the preliminary plan, the applicant for PUD district zoning shall submit four (4) copies of a final development plan to the Zoning Administrator. The Zoning Administrator shall promptly transmit two (2) copies to the Planning Commission, One (1) copy to the Township Board, and retain one (1) copy.
2. Simultaneously with the submission of a final development plan, the applicant shall submit to the Zoning Administrator, an application for rezoning requesting that the land included in the final plan for the PUD be zoned a PUD Zoning District. Consideration of the requested zoning amendment shall then proceed in accordance with the Ordinance amendment chapter thereof, and Public Act 184 of 1943, being the Township Rural Zoning Act, as amended.

**SECTION 411. FINAL PLAN CONTENT**

The final plan shall include all the following information, unless the same is not reasonably necessary for the consideration of the PUD:

1. A plot plan based on an accurate certified land survey showing:
2. Location, size, and type of present buildings or structures to be retained or removed;
  - a) Location of existing and proposed buildings, structures, or other improvements;
  - b) Location of existing and proposed street, easements, right-of-way, drives, and parking lots;
  - c) Location of water and sewer lines;
  - d) Storm drainage;
  - e) Topographical features including contour intervals no greater than five (5) feet;
  - f) Bodies of water;
  - g) Ditches and water courses;
  - h) Ground cover and other pertinent physical features of the site such as trees;
  - i) Proposed landscaping;
  - j) Location of existing improvements;
  - k) Location of lot lines;
  - l) Loading and unloading facilities;
  - m) Wetlands; and
  - n) Exterior lighting and signs.
3. Preliminary architectural sketches and/or a general statement as to the type of construction and materials to be used in the proposed buildings or structures. Height and area of buildings and structures shall be described.
4. The period of time within which the project will be completed.
5. Proposed staging of the project, if any.
6. Gross areas of building and parking.
7. Delineation of the one hundred (100) year flood plain, if applicable and any proposed uses therein.

8. A description of all aspects of such plan which might have an adverse effect on public health, safety, and welfare.
9. An environmental impact statement or report, if requested by the Planning Commission.
10. Current proof of ownership of the land to be utilized or evidence of a contractual ability to acquire the land, such as an option or purchase contract.
11. Such other data or information as required by the Planning Commission.

#### **SECTION 412. PUBLIC HEARING**

The Planning Commission shall hold a public hearing pursuant to the provisions of Public Act 184 of 1943, as amended, and the provisions of this Ordinance for the purpose of receiving comments relative to the final development plan and the proposed rezoning.

#### **SECTION 413. FINAL PLANNING COMMISSION RECOMMENDATION**

The Planning Commission shall transmit its recommendations concerning the final development plan and the proposed zone change along with any recommended changes, conditions, or modifications to the Township Board.

#### **SECTION 414. FINAL APPROVAL BY TOWNSHIP BOARD**

Final approval (together with conditions of approval) or disapproval of the zone change shall be by the Township Board. A copy of the final zone change, if finally approved, shall be forwarded to the Township Clerk for filing with the Township Zoning Ordinance and shall be an official amendment to that Ordinance by the procedures required therein. If all conditions and requirements of this Chapter are fulfilled, the Township Board shall approve the planned unit development. The Township Board may attach conditions to any PUD approval.

#### **SECTION 415. TIME LIMITATIONS ON DEVELOPMENT**

Each development shall be under construction within one (1) year after the date of rezoning by the Township Board. If this requirement is not met, the Township Board may grant an extension provided the developers present reasonable evidence to the effect that said development has encountered unforeseen difficulties, but is now ready to proceed. Should the aforementioned requirements not be fulfilled within a period of one (1) year final approval by the Township Board, any building permit issued for said development shall be invalid and void, and the Township Board may initiate

proceedings to hold a public hearing for the purpose of rezoning said property.

#### **SECTION 416. PERFORMANCE BONDS**

The Township Board, in connection with reviewing any application for a final development plan, will require reasonable undertakings by the applicant to guarantee and assure by agreement, including a performance bond, such bond shall be in the amount of ten percent (10%) of the total cost of the development. The bond shall be posted with the filing of the application. The bond is required in order to ensure that the development will be executed in accordance with the approved plan. Bond non-refundable for non-performance. Performance Bonds to include PUDs, Site Condominium Plans, Mobile home, Condominium Project. This bond would be non-refundable for non-performance.

#### **SECTION 417. REQUIRED IMPROVEMENTS PRIOR TO ISSUANCE OF OCCUPANCY PERMIT**

The Township Board is hereby empowered to stipulate that all required improvements be constructed and completed prior to issuing an occupancy permit. In the event that said improvements are partially completed to the point where occupancy would not impair the health, safety, and general welfare of the residents, but are not fully completed, the Building Inspector may, upon the recommendation of the Township Board, grant an occupancy permit so long as the developer deposits a performance bond with the Township Clerk in an amount equal to the cost of the improvements yet to be made, said improvements to be completed within one (1) year of the date of the occupancy permit. This bond would be non-refundable for non-performance.

#### **SECTION 418. ADDITIONAL PROVISIONS**

All provisions of this Ordinance and other ordinances of the Township shall apply to the PUD district except where they are inconsistent. In such cases, the provisions of this Chapter shall control.

**SECTION 419. SITE CONDOMINIUM SUBDIVISION APPROVAL** *This section repealed by Ordinance # 67, 7-05-2003 - Site Condominiums now covered under Section 505 - Table of Special Use Permit Standards*

#### **SECTION 420. MODIFICATION OF PUD PLANS**

Minor changes to a PUD site plan may be approved administratively in writing by the Zoning Administrator provided the changes comply with all applicable requirements of this Ordinance and all other Township

regulations and state laws. Any other changes shall require a formal amendment to the developers' PUD Ordinance for approval.

**SECTION 421. OPEN SPACE PRESERVATION (Ordinance #67, 7/5/2003)**

1. **Open Space Development Option.** Any parcel of land in Haring Township which is zoned to allow for residential development, may be developed at the option of the landowner with the same number of dwelling units that could otherwise be developed on the entire land area on a portion of the land not to exceed fifty percent of the entire land area if all of the following apply:
  - a) The land is zoned at a density equivalent to two or fewer dwelling units per acre, or if the land is served by a public sewer system, three or fewer dwelling units per acre;
  - b) At least fifty percent of the entire land is set aside as open space to remain perpetually in an undeveloped state by means of a conservation easement, plat dedication, restrictive covenant or other legal means that runs with the land. Unbuildable areas such as wetlands do not count towards the 50% open space minimum.
  - c) The development does not depend upon the extension of a public sewer or public water supply system, unless development of the land without exercise of the option provided by this section would also depend upon such and extension; and
  - d) The option provided by this Section has not been previously exercised with respect to the land.
2. **Re-zoning.** After a landowner exercises the option provided by this Section, the land may be re-zoned accordingly.
3. **Other Regulations Applicable.** Except as otherwise provided in this Section, the development of land under the open space option provided herein is subject to all other provisions of the Haring Township zoning ordinance as well as other applicable ordinances, laws and rules including rules relating to suitability of groundwater for on-site water supply for land not served by public water, and rules relating to suitability of soils for on-site disposal for land not served by public sewers.
4. **Required Procedures**

- (a) **Site Plan Review.** Development under this Section shall be subject to the plan review process set forth in Section 206 of this Ordinance. Where a landowner elects to proceed under this Section, in addition to an open space site plan, a "parallel" site plan shall be prepared showing a feasible development under the requirements of the specific zoning district in which the development is to be located and the requirements of any and all State, County and Township regulations. It must be determined by the Planning Commission that the parallel plan or conventional can meet all current zoning and subdivision regulations if developed without reliance upon the open space provisions of this section. The Planning Commission may waive the submission of a parallel plan if it is determined that the number of housing units proposed for open space development is clearly below what would otherwise be allowable for the site.
- (b) **Special Use Permit.** Development under this Section shall also be subject to the Special Use Permitting process set forth in Chapter 5 of this Ordinance.

**SECTION 422. MIXED-USE COMMERCIAL/RESIDENTIAL PUDs (Ordinance #13-84)**

1. **Purpose.** The purposes of the regulations stated in this Section 422 are as follows:
- a) To allow for limited commercial development in areas where, because of the nearby presence of federal or state highways, or major thoroughfares, there is a demand for commercial use, but due to the close proximity of established residential areas, there is a need to ensure that the commercial development is designed and constructed in a manner that is protective of surrounding residential populations.
  - b) To provide architectural and site design standards in order to promote harmonious development in the Township.
  - c) To preserve woodlands, view sheds and other natural features within the Township, to the extent practicable.
2. **Findings.** The Township finds that the standards of this Section 422 are necessary to promote the health, safety and welfare of the Township and its residents, based on the following findings:
- a) Design standards are important safety and aesthetic considerations for the Township's future image and the citizens' quality of life.

- b) Architectural guidelines are necessary to ensure building design is consistent with the intended character of the area.
- c) Commercial growth and development put an increased demand upon natural resources. The protection of natural resources is a matter of paramount public concern, as provided by Article IV, Section 52 of the State of Michigan Constitution and the Michigan Environmental Protection Act of 1970, MCL 324.1701, et seq.

### 3. **Mixed-Use Commercial/Residential PUD Regulations.**

- a) Mixed-use commercial/residential PUDs are permitted in the Township only in accordance with the provisions of this Section 422.
- b) Permitted Uses. Uses that may be approved within a mixed-use commercial/residential PUD shall include the following:
  - 1) Any use permitted by right in the "C" General Commercial Zoning District.
  - 2) The following uses that are permitted by special land use in the "C" General Commercial Zoning District:
    - i) Churches and religious institutions.
    - ii) Veterinary clinics and kennels.
    - iii) Bars and nightclubs (not including "sexually oriented businesses").
  - 3) Any use permitted by right or by special land use permit in the "R" Residential Zoning District, except that "transitional/shelter housing" shall not be permitted.
- c) General Requirements.
  - 1) Commercial uses shall comprise not more than 60% of the developed land area, exclusive of open space.
  - 2) The density of development in the residential phase of the PUD shall not be more than 4 units/acre. Multifamily buildings shall be designed and constructed to avoid excessive length and box-like appearance and to have varied architectural features.
  - 3) Commercial uses shall be physically separated from adjacent residential uses (both existing residential

uses and those included within the PUD) by means of a berm and buffer zone of undeveloped or landscaped open space that is of significant size, width and height, so as to visibly screen the commercial uses from the residential uses, and so as to ensure that noises from the commercial phase do not interfere with the peace, quiet and enjoyment of the residential uses. The open space used to buffer the commercial and residential uses shall comprise not less than 10% of the total land area included in the PUD plan.

- 4) The development shall be served by public wastewater and public water supply systems.

d) Architecture.

- 1) All proposed commercial buildings shall utilize quality architecture to ensure a building is compatible with surrounding uses, protects the investment of adjacent landowners, blends harmoniously with the natural features and promotes a high quality image to those living in and traveling through the Township.
- 2) The applicant is required to submit and present architectural concepts and alternatives at a study session with the Planning Commission to receive comments on compliance with the architectural guidelines prior to preparations of detailed design drawings.
- 3) Building designs shall be reviewed by the Planning Commission as a part of final plan review under the following criteria:
  - i) Commercial buildings shall possess architectural variety.
  - ii) Commercial buildings shall be consistent with the scale and proportion of existing structures in the surrounding area.
  - iii) For commercial buildings, a minimum of eighty percent (80%) of the exterior finish material of all front building facades (excluding the roof) visible from the public street, private street, parking lot or adjacent residentially zoned land, exclusive of window areas, shall consist of facing brick, cut stone, split face block, fluted block, scored block, native, field stone, cast stone or wood with an opaque or semi-transparent stain, or bleaching oil.

Any other block or building material not specifically listed may be reviewed and approved by the Planning Commission if the material is compatible with surrounding uses, protects the investment of adjacent landowners, blends harmoniously with the natural features and promotes a high quality image to those living in and traveling through the Township.

- iv) Exterior Insulation and Finishing Systems (EIFS) material shall not be the primary building material. The remaining maximum twenty (20) percent of the facade may utilize other material for architectural detailing such as fiberglass reinforced concrete, polymer plastic (fypon) or EIFS. The Planning Commission may permit other materials for facades not visible from a public street that are adequately screened from adjoining land uses.
- v) Front building facades for commercial buildings shall provide a minimum 15% glass window but shall not exceed 80% glass. Calculations are exclusive of the roof area. The Planning Commission may allow a lower percentage of glass windows where it has been demonstrated that industry-recognized safety or security practices for the use being proposed mandate a lower percentage of glass windows.
- vi) Building materials and colors shall be related to and harmonious with the surrounding area.
- vii) Roof shape and materials shall be architecturally compatible with adjacent buildings and enhance the predominant streetscape. Subtle colors shall be used for roofing material. Metal roofs shall only be permitted if compatible with the overall character of the building, and architectural elements are used to significantly reduce the roof mass when viewed from the street.
- viii) Commercial buildings shall provide architectural features, details, and ornaments such as archways, colonnades, cornices, peaked rooflines or towers.
- ix) Building walls (both commercial and residential) over 100 feet in length shall be broken up with items such as varying rooflines, varying building lines, recesses, projections, wall insets, arcades,

windows, architectural accents, bands of complementary building materials and trees.

- x) Commercial building entrances shall utilize windows, canopies, and/or awnings, provide unity of scale, texture, and color and provide a sense of place.
- xi) Rooftop equipment shall be illustrated on the plans and shall be screened from view by parapet walls or other architectural elements that complement the overall building design.
- xii) Commercial building rear facades shall be constructed to a finished quality that is comparable to the front facade where visible to a public street or residential district or use, but strict adherence to the percentage requirements for finish materials and window glass, as stated in subsections (iii) and (v), shall not be required. This subsection shall not apply to a building rear façade that is viewable only from highway U.S.-131, and which is not otherwise viewable from a residential district or use.
- xiii) Overhead canopies for gas stations or other uses shall be designed to be compatible with the architectural characteristics of the principal building such as peaked roofs, shingles, support structures that match or simulate materials of the principal building, lighting fixtures fully recessed into the canopy and in neutral colors.
- xiv) Exterior neon, LCD or LED lights (including such interior lights that are clearly visible from the exterior) are generally prohibited, except that they may be used only as architectural detail, they must be complementary to the overall design of the building, and they must be specifically found by the Planning Commission to be compatible with surrounding properties. Such lighting shall be indicated on the building elevation and allowed only as part of site plan approval. The provisions of this subsection do not apply to small interior neon, LCD or LED signs that are used to communicate directional or operational information such as "exit", "open" and "closed."
- xv) The commercial portion of the mixed-use PUD shall complement the overall PUD plan and the commercial

buildings therein shall have an architecture and appearance that are reasonably compatible with the buildings in the residential portion of the PUD.

- xvi) Loading docks, refuse accumulation areas, truck maneuvering area and other utility or service areas shall be appropriately screened from view by landscaping, berms or other effective means.
- e) Landscaping and Overall Site Design. Landscaping and design elements of the PUD plan shall comply with the following requirements:
- 1) Plants that have been identified as invasive or potentially invasive plants in the region shall not be used for any landscaping purposes.
  - 2) The overall design shall promote the impression of a natural landscape.
  - 3) Landscaping shall be provided along walls to reduce the visual impact of building mass as viewed from the street.
  - 4) Retention, detention and the overall stormwater system shall be designed to use "best management practices" and create the appearance of a natural pond or feature including gentle (5:1) or varying side slopes, irregular shapes, water tolerant grasses and seed mixes at the bottom of the pond/basin; appropriate flowers, shrubs and grasses along the banks based on environment (wet, dry, sedimentation basin v. pond) to improve views, filter runoff and enhance wildlife habitat.
  - 5) *Parking Lots.* The following landscaping requirements shall apply to parking lots:
    - i) Parking lots, or any parts thereof, which are located in the front yard or which are adjacent to or visible from within 20 feet of any public right-of-way (excepting the highway U.S.-131 right-of-way) shall have perimeter landscaping, between the parking lot and right-of-way, as follows:
      - A. The perimeter landscaping shall include a landscaped area measuring at least ten feet in width.
      - B. The landscaped area shall include at least one tree, measuring at least eight feet in height at

the time of planting, for every 30 feet, or fraction thereof, of street frontage of the parking lot.

- C. The landscaped area shall also include a continuous screen, measuring at least thirty-six inches in height above the street grade, consisting of a hedge, berm, brick wall, or combination thereof. The Planning Commission may determine the location of the screen so that it does not cause a traffic hazard, vision obstruction or other hazard to public safety.
- ii) For parking lots of over 100 spaces or 30,000 square feet, the interior of the parking lot shall have one square foot of landscaped area for each 15 square feet of paved area. The following requirements shall apply to the interior landscaped areas:
- A. Traffic islands shall be located to improve traffic flow and views.
  - B. Traffic islands shall have a minimum width of 18 feet and a minimum area of 150 square feet.
  - C. Details on traffic islands shall be provided on the PUD site plan, including radii, dimensions, adjacent parking space depth, ground cover and any lighting or irrigation.
  - D. There shall be at least one deciduous tree for each 150 square feet, or fraction thereof, of interior landscaped area. Around each tree, there shall be an open land area of at least 75 square feet, with a minimum diameter of four feet at the tree trunk.
  - E. All interior landscaped areas of a parking lot shall be designed as "bio-retention" areas, to facilitate the treatment and ground absorption of stormwater runoff using a combination of microbial soil process, infiltration, evaporation, and appropriate plantings.
- 6) Loading and service bay doors shall not face a public street. Such doors shall be in the rear of the site. Where this is not practical, location on the side may be permitted provided additional walls and landscaping are provided, and/or such areas are recessed, to minimize

the negative visual impact. This subsection shall not apply to a loading or service bay door that is viewable only from highway U.S.-131, and which is not otherwise viewable from a residential district or use.

- 7) Generally, curbs must be used throughout the parking lot and paved areas. The Planning Commission may grant an exception upon finding that overall stormwater disposition will be enhanced, that snow removal will be facilitated, or that there will be other beneficial improvements to the overall site design.
- 8) *Outdoor Storage*. The following requirements shall apply to outdoor storage:
  - i) The outdoor display of items for sale, whether a few items or on a large-scale basis, such as motor vehicle sales establishments, shall be arranged in a neat and orderly fashion of rows and columns. All outdoor display items for sale shall be setback from the frontage road right-of-way so as to be located, at a minimum, inside of the greenbelt required by subsection (11), below, and a minimum of twenty (20) feet from any side property line.
  - ii) The outdoor storage of other items, such as vehicles, equipment and extra supplies, shall be performed by placing the items in a fenced and screened area, to the side or rear of the principal building on the premises.
- 9) Fences, if proposed, must be shown on the site plan, including details on materials and color. Fences shall be durable and decorative in nature. Chain link fences shall only be approved for a location not generally visible to the public or dwelling unit occupants. Any visible segments of fence will be vinyl coated with additional landscaping provided to screen the view.
- 10) A minimum 35 foot greenbelt is required along state highways and other major thoroughfares (excluding highway U.S.-131), as measured from the edge of the highway or road right-of-way. Said greenbelt shall be landscaped and planted in accordance with Section 422.3(e)(6)(i)B and C, except for approved driveways.
- 11) Buildings shall be set back a minimum of 100 feet from the right-of-way for state highways and other major

thoroughfares, excepting the highway U.S.-131 right-of-way.

f) Commercial Lighting.

- 1) All exterior lighting shall be within fully-shielded fixtures, so that no light may escape above the horizontal plane. The wattage of any single lamp fixture shall not exceed 320 watts.
- 2) Lighting mounted onto poles or any structures intended primarily for mounting of lighting shall not exceed a mounting height of 40% of the horizontal distance of the light pole from the property line, nor a maximum height of 30 feet, whichever is lower.
- 3) No lighting on any site shall cause or create obtrusive light, or light which protrudes onto any adjacent or nearby residential property.

g) Other.

The PUD plan for a mixed-use commercial/residential PUD shall be reviewed in accordance with, and shall otherwise comply with, the PUD regulations of this Ordinance, as stated in Sections 401 through 420, to the extent that those regulations are not inconsistent with the above minimum requirements. Where the regulations of this Section 422 are more stringent, the more stringent regulations shall apply.

**TAB B**

**STATE OF MICHIGAN**  
**DEPARTMENT OF LICENSING & REGULATORY AFFAIRS**  
**STATE BOUNDARY COMMISSION**

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In the Matter of the Petition to Annex  
Territory in Clam Lake Township  
to the City of Cadillac, Wexford County

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Docket No. 13-AP-2

**AFFIDAVIT OF DALE ROSSER**

I, Dale Rosser, being sworn, say that:

1. I am the Township Supervisor for the Township of Clam Lake.
2. I have been personally involved with Clam Lake's plans to extend utility services to the Township from Haring Township.
3. In 1999, Clam Lake hired the engineering firm, Wilcox & Associates, to plan a sewer system to serve the Clam Lake DDA. Ultimately, in 2003, Wilcox & Associates recommended that Clam Lake cooperate with Haring as the most feasible way to provide sewer service to the DDA.
4. In 2006, Clam Lake residents living around Berry Lake inquired to Clam Lake officials about obtaining sanitary sewer service because of concerns about water quality in the Lake. In response, Clam Lake hired a utility consultant, Richard Pierson, to evaluate the Township's options. Just like Wilcox & Associates, Mr. Pierson recommended, in 2007, that Clam Lake cooperate with Haring for the provision of sewer services.
5. In July 2011, I met with the Haring Supervisor, Bob Scarbrough, regarding the timeline for Haring to develop and construct its own WWTP.
6. On August 4, 2011, I met with Supervisor Scarbrough to discuss the willingness of the Township to partner in a new WWTP.

7. On August 17, 2011, there was a meeting of several Township officials, including myself and Supervisor Scarbrough, Trustee Wilkinson (Haring), Trustee Houston (Clam Lake) and Assessor Whetstone (Clam Lake), to discuss the Townships partnering in a Haring WWTP.

8. On September 15, 2011, I, Trustee Houston and Assessor Whetstone attended the Haring Utilities Committee meeting and formally proposed a joint partnership in the Haring WWTP.

9. On October 14, 2011, the same Clam Lake officials attended the Haring Utilities Committee meeting to continue discussions of the Haring WWTP.

10. On October 24, 2011, I met with Douglas Coates, PE, of Gosling Czubak Engineering, regarding the provision of engineering services to Clam Lake for the design of wastewater collection facilities to be used for connection to the Haring WWTP.

11. On October 24, 2011, I met with the Haring Utilities Committee, to discuss jointly working with Gosling Czubak Engineering.

12. On December 14, 2011, the Clam Lake Board adopted a motion, formally authorizing me to enter into discussions with Gosling Czubak Engineering regarding a sewer partnership with Haring Township, and to develop engineering plans for the same.

13. I make this affidavit based upon my personal knowledge, and if sworn as a witness I am competent to testify to the truth of the averments contained in this affidavit.

[signature on next page]

*Dale A Rosser*

Dale Rosser

STATE OF MICHIGAN )  
 ) ss  
COUNTY OF WEXFORD )

Subscribed and sworn to by Dale Rosser before me this 13 day of December, 2013, in Wexford County, Michigan.

*Melissa D. Miles*

Notary Public

*Wexford*

County, Michigan

Acting in Wexford County, Michigan

My Commission Expires: 9-3-2019

MELISSA D. MILES  
NOTARY PUBLIC, STATE OF MI  
COUNTY OF WEXFORD  
MY COMMISSION EXPIRES Sep 3, 2019  
ACTING IN COUNTY OF *Wexford*

**TAB C**

WATER & WASTEWATER MANAGEMENT CONSULTING

RICHARD PIERSON

FILE COPY

September 6, 2006

Mr. Bob Mackey  
Trustee, Clam Lake  
8809 East M-115  
Cadillac, MI 49601

via fax + mail

Re: Utility Management Services  
Letter Agreement (see attached 2 pages)

Dear Bob;

Two months ago the Township authorized work to research and implement steps to achieve public sewer and water for Clam Lake Township. We are writing to provide a brief update on the process and we have included a short letter agreement to provide scope and formalize the work if the Township wishes to do so.

Regarding Clam Lake Township public utilities, we have had two in-depth brain-storming sessions with the engineers for Haring Township, primarily with Gary Voogt, (principal with Moore and Bruggink engineers). We spoke with them regarding options for the Mackinaw Trail area + the M-55 / Crosby Road interchange as the short-term immediate needs, plus discussed the long-term needs of Berry and Stone Ledge Lakes. As you know, Haring Township plans to move aggressively forward to achieve utility independence, and we will maintain contact with them on a regular basis. We continue to research the files and documents, formulating strategies for Clam Lake Township to (i) construct its own water and wastewater system (independent), or (ii) to become part of the Haring proposed system(s), or (iii) utilize the City of Cadillac system as authorized by the 97-98 court ruling, or (iv) a combination of the above. Each of the options present challenges (opportunities) for the Township.

A summary of the current discussion follows:

*Clam Lake Public sewer:*

- Focus on DDA district: Options include pumping into City system, paying the city the pro-rata share of their East side interceptor vs. pumping up US 131 to the proposed Haring Township system.
- Focus on Crosby Road interchange: This option appears most feasible to join with Haring Township flowing north.

*Clam Lake Public water:*

- DDA district: It may be feasible to construct an independent water system for the DDA district that could service areas beyond.
- Crosby Road interchange: This option appears most feasible to join with Haring Township, receiving water from the north.

The above options will require engineering services and we will be recommending the Township contract with Haring Township's engineers in the near future to provide such services. I would, of course, coordinate and communicate with all necessary parties, including the DPW/BPW in these on-going efforts.

Short term, we will continue to investigate options and schedules, while monitoring and supporting Haring's work, plus we will need to begin to meet with and share strategies with the Mackinaw Trail DDA district and other interested developments in the area. It will be necessary to have the engineers prepare sewer feasibility studies for Berry and Stone Ledge Lakes in order to determine how they fit in the long-term utility solution(s).

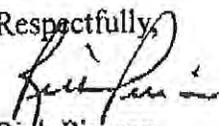
As you review and consider formalizing the working arrangement, a brief synopsis of my qualifications may help clarify the scope of the agreement:

- Technical background including Water and Wastewater licenses for MI
- Industrial Chemistry background from Grand Valley University
- Masters in Business from Western Michigan
- 25+ years experience in managing water/wastewater facilities and staff
- 25+ years capital project management and implementation
- Positive working relationship with numerous engineering firms + legal counsels
- Strong public relations background for public presentations and discussions

Please review the attached Letter Agreement if you would like to formalize the Township Board's continued pursuit in the utility endeavors.

It would be a great pleasure to successfully implement utility projects for the Township.

Respectfully,



Rich Pierson

Attch: 2-page Letter Agreement

Cc: John Divozzo - letter only - via fax  
Gary Voogt, Moore + Bruggink - letter only - via fax

C:\Documents and Settings\Owner\My Documents\Contracts\Clam Lake proposal.doc

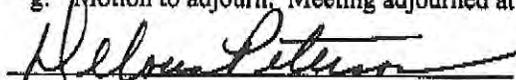
**TAB D**

**CLAM LAKE TOWNSHIP  
REGULAR MEETING  
December 14, 2011**

**approved**

**7:00 P.M.**

- i. Meeting called to order by Supervisor Rosser.
- ii. Members present: Payne, Rosser, Mackey, Houston and Peterson. Members absent: none  
Others present: 3 area residents, and Assessor Molly Whetstone.
- iii. The meeting was opened with the pledge to the American flag and to a brief public comment.
- iv. Minutes of the November regular meeting were approved as presented. All in favor
- v. Motion by Mackey, seconded by Houston, to approve agenda as amended. All in favor.
- vi. Unfinished business
  - a. Motion by Houston, seconded by Mackey to repeal Cemetery Ordinance #40 that was adopted in November. All in favor. Carried.
  - b. Motion by Payne, seconded by Mackey, to adopt Cemetery Ordinance Amendment, Ordinance #40 to amend CLT Cemetery Ordinance #28 All in favor. Carried.
  - c. Motion by Mackey seconded by Payne, to give Supervisor permission to enter into discussion with Gosling and Czubak Engineering regarding sewer partnership with Haring Twp. to develop engineering plans, etc. All in favor. Carried.
- vii. New business
  - a. Motion by Mackey, seconded by Payne, to adopt Ordinance #41 on Medical Marijuana Licensing Ordinance. An Ordinance pursuant to Act 246 of the Public Acts of 1945, as Amended to permit and regulate medical Marijuana primary caregiver facilities within Clam Lake Township under the terms and conditions of this Ordinance, to insure the public health, safety and welfare and to provide penalties for violations thereof. All in favor. Carried.
  - b. Motion by Payne, seconded by Houston to adopt Resolution 5 of 2011 Resolution imposing moratorium on medical marijuana establishments. All in favor. Carried.
  - c. Motion by Houston seconded by Mackey, to send letter of intent to participate in the planning process to update the Wexford Co. Hazard Mitigation plan. All in favor. Carried.
  - d. Motion by Houston, seconded by Mackey, to adopt Resolution #6 of 2011 for Supervisor salary increase to \$14,000. Affective January 2012. All in favor. Carried.
  - e. Motion by Houston seconded by Mackey to pay bills as presented. All in favor. Carried.
  - f. Motion by Mackey, seconded by Houston, to send out a mailing to residents affected by the 425 Agreement areas reminding them of the public hearing on January 9, 2012 on the proposed annexation of land in CLT to the city of Cadillac. All in favor. Carried.
  - g. Motion to adjourn. Meeting adjourned at 8:05

  
Delores Peterson, Clerk

# T A B E



December 17, 2013

**Subject: Response to Teridee's Post Hearing Comments**

The following comments are provided in response to "Teridee's Post Hearing Comments in Support of Annexation Petition," relative to water and sewer utility extensions.

In particular, we are responding to the "concerns" that were raised by Exxel Engineering, Inc. ("Exxel"), relating to the (a) the reliability of the Haring Charter Township public water supply system, and (b) the quality, pressure and fire flow of water provided by the Haring Charter Township public water system. We are also responding to concerns that were raised by TeriDee and Exxel, relating to the cost and timing for extending Haring water and wastewater services to the Transferred Area.

For the reasons explained below, Haring water and wastewater service can feasibly and reliably be provided to the Transferred Area. Exxel has not raised any concerns that would change that conclusion. From an engineering perspective, Haring is equally or better suited to provide water and wastewater services to the Transferred Area, as compared to the City of Cadillac.

**Water System Reliability**

Exxel questioned the reliability of the Haring water system, based on the fact that service would be provided to the Transferred Area by way of a dead end water main. For the following reasons, this is not a valid reason to prefer City services over Haring services:

- Both the City watermain extension and the Haring watermain extension would require a dead end watermain.
- There is no advantage to either source since both would be subject to potential loss of service due to a watermain break.

**Water Quality**

Exxel questioned the quality of the Haring water supply, based on outdated information from 2007. Exxel's concerns about Haring water quality are unfounded and incorrect. For the reasons explained below, the *current* Haring water quality is as good or better than City water quality:

- Water chemistry that impacts taste and odor are: Iron, Chlorides, Sulfate, Nitrites and Sulfide.
- Public water systems are required to file a Consumer Confidence Report ("CCR") annually and report any contaminants found in their water system and indicate if there is any health risk associated with the water quality. Both Haring and the City filed a CCR in 2012 and neither were required to report any health risk associated with their water.

We also used these reports to compare their respective water quality. The pertinent data shows that Haring water quality is better than the City's water quality:

1. A satisfactory level for Chlorides is 50 ppm. The Township has a reported level of 19 ppm, whereas the City reported a higher level of 34 ppm.
  2. Water with a sulfate level of 25 or less is considered excellent. The Township was non-detect for sulfate, while the City reported a value of 7 ppm.
  3. With regard to iron, both the City and the Township are in the satisfactory range of 0.3 to 0.5 ppm.
  4. The CCR for the City and Haring did not list sulfide, which would indicate that sulfide was non-detect in both systems.
- Exxel mentioned the 2007 Moore & Bruggink report, which made comments about odor complaints with Haring water. Those complaints have been properly addressed. Haring has implemented a regularly scheduled flushing program since the time of the 2007 Moore & Bruggink report. Prior to 2007, Haring would wait until a customer filed a complaint before flushing the system. This change in practice has properly alleviated odor complaints.

### **Water Pressure and Fire Flow**

With respect to Exxel's concerns about water pressure and fire flow, we respond as follows:

- We have attached a copy of our assumed static water system pressures. The static water pressure is dependent on elevations. The attached document shows the assumed site elevation and maximum elevated tower elevation.
- We recently completed a computer hydraulic model of the Haring water system utilizing the industry recognized program WaterCAD. The results of the computer modeling, which are attached, further confirm our previous calculations. Based on the computer model, the Haring system should be capable of furnishing a fire flow of 828 gallons per minute (gpm) while maintaining a residual system pressure of 20 psi. The calculated residual pressure meets MDEQ requirements and verifies that the Haring system would be capable of providing a sufficient fire flow while still meeting the required residual pressure.
- Based on our calculations, if a higher than 828 gallon per minute (gpm) fire flow is desired, a booster pump and/or storage tank will be required. However, this should not be required if the Transferred Area is developed in accordance with the zoning provisions of the Townships' Act 425 Agreement.
- Although it should not be required, furnishing a storage tank at the site would not only



improve the available system pressure and fire flow, but would add to the reliability of the proposed system. This is true, whether City or Haring water services are provided to the Transferred Area.

- Exxel incorrectly implies that ISO requires a certain fire flow. That is not correct. ISO does not require any system fire flow rate. ISO simply rates a system from 1 – 10, based on several factors, one of which is available fire flow. Insurance companies can set insurance rates on the ISO rating.

### **Cost Analysis**

We point out certain flaws in Exxel's cost calculations, as those calculations pertain to the cost of extending City vs. Haring utility services:

- Exxel used incorrect quantities and pipe sizes when they estimated the cost to extend Township water and sewer to the site. We believe the cost estimates we have previously prepared are a reasonable opinion of the cost it would take to extend Township water and sewer to the site.
- When Exxel modified their earlier estimates, they did not use the same unit prices for each alternative. If we use the same unit prices for extending City water and sewer to the site, as Exxel applied to Haring work, the cost for extending City water would be \$740,000 and sewer would be \$665,000, rather than \$635,000 and \$538,750, as stated in Exxel's estimate with a revision date of October 22, 2013.

### **Feasibility of Utility Cost**

TeriDee complains about the fact that it will be required to pay a higher upfront capital cost for extending Haring water and wastewater services to the Transferred Area. For the reasons explained below, these complaints are not well-founded:

- Our engineering firm is regularly engaged in commercial development projects. Based on our professional experience, commercial developers routinely pay for extension of water and sewer utilities to their site, as a precondition to site development.
- TeriDee knowingly purchased property in Clam Lake Township and so should have anticipated the cost of extending township utilities (not City utilities) to the property if it desired to engage in commercial development.



- The costs to obtain utility services from Haring are not unusually high:
  - Example – The Meijer store in Acme is extending water and sanitary sewer lines at Meijer's expense. Based on contractor bids, the cost for water is approximately \$674,000 and the sanitary sewer is approximately \$327,000. Both sewer and water are relatively close to the Meijer site. The water, however, involves two bores of M-72. The majority of the sewer construction is in an open field and so conflicts with other utilities have not arisen.
  - Example – Blair Township installed a sanitary sewer collection system in 2007-08 to serve a primarily commercial district. The sewer was paid by special assessment with the entire cost being paid by the benefitted property owners. Vacant properties paid an assessment of \$4,356 per acre for sewer only access fee. Additional charges were imposed for connection fees. One 76 acre parcel paid \$1,987,000, including the connection fee at \$3,100 per REU.

### **Timing**

TeriDee has raised concerns with respect to the timing of extending Haring water and wastewater services to the Transferred Area. For the reasons explained below, those concerns are not well founded.

### Water

Providing water service from Haring will not take significantly longer, as compared to how long it would take to extend water service from the City. The Haring route will not necessarily require easements. The preliminary routing is shown along county road or MDOT right-of-way. Thus, asserting possible delays in construction due to acquiring easements is not warranted.

Additionally, the City route will require construction permits from MDOT to cross US-131. This process can take several months, depending on the design issues.

The route from Haring is longer than the route from the City by approximately 7,900 feet. However, a typical production rate for watermain construction is 500 feet per day. This means that there would be only two to three weeks of additional construction time for the extension of Haring water, as compared to the extension of City water.



Sewer

TeriDee has alleged that the construction timetable for the Haring wastewater treatment plant (WWTP) has been delayed or slipped. That is not the case. Haring has consistently anticipated starting construction in 2014. Project schedules have consistently shown anticipated bidding in winter 2013, with construction starting spring 2014. Projected completion dates have been estimated as summer 2015, but could be earlier, depending on actual construction progress.

Haring has secured a funding source through a rigorous federal funding process. Haring completed the Phase I bidding process in December 2012, through which it has already procured all the major treatment equipment components. We have every reason to believe that the Haring WWTP will be available for service, as scheduled, in summer 2015 or earlier.

Prepared by:



Douglas A. Coates, P.E.  
Manager of Civil Engineering Services



Clyde Johnson, P.E.  
Senior Project Manager

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**TAB F**

HARING TOWNSHIP  
WATER SYSTEM  
STATIC PRESSURES

Label	Location	Elevation (ft)	Pressure (psi)
H-101	Third Ave and Sixteenth St	1,294.00	68.6
H-102	Third Ave and Fourteenth St	1,296.00	67.7
H-103	Thirteenth St E of Fourth Ave	1,297.00	67.3
H-104	Fifteenth St and Fourth Ave	1,295.00	68.1
H-105	Fourth Ave S of Sixteenth St	1,295.00	68.1
H-106	Fourth Ave S of Seventeenth St	1,297.00	67.3
H-107	Sixteenth St and Fifth Ave	1,295.00	68.1
H-108	Fourteenth St and Fifth Ave	1,297.00	67.3
H-109	Fourteenth St and Sixth Ave	1,298.00	66.8
H-110	Fourteenth St and Seventh Ave	1,299.00	66.4
H-111	Seventh Ave N of Fifteenth St	1,295.00	68.1
H-112	Fifteenth St and Sixth Ave	1,296.00	67.7
H-113	Sixteenth St and Sixth Ave	1,295.00	68.1
H-114	Sixth Ave Just N of Seventeenth St	1,298.00	66.8
H-115	Seventh St and Pine St	1,297.00	67.3
H-116	Pine St between Tenth and Seventh St	1,298.00	66.8
H-117	Tenth Ave and Pine St	1,300.00	66
H-118	Tenth Ave and Majerle St	1,301.00	65.5
H-119	Majerle St 2nd W of Sixth St	1,300.00	66
H-120	Majerle St 1st W of Sixth St	1,300.00	66
H-121	Majerle St and Sixth St	1,297.00	67.3
H-122	Sixth Ave at N end	1,298.00	66.8
H-123	Thirteenth St E of Leeson Ave	1,300.00	66
H-124	Thirteenth St 2nd W of Leeson Ave	1,301.00	65.5
H-125	CR 39 N of Thirteenth St	1,303.00	64.7
H-126	CR 39 2nd N of Thirteenth St	1,306.00	63.4
H-127	N End of CR 39 at Pine St Extended E	1,304.00	64.2
H-201	CR 39 and Tank Drive	1,320.00	55.4
H-202	CR 39 and Boon Road	1,318.00	56.4
H-203	Boon Road 1st E of CR 39	1,317.00	56.9
H-204	Boon Road 2nd E of CR 39	1,315.00	57.9
H-205	Boon Road 3rd E of CR39	1,315.00	58
H-206	Boon Road 4th E of CR 39	1,311.00	59.9
H-207	Boon Road 5th E of CR 39	1,311.00	60
H-208	Boon Road 6th E of CR 39	1,308.00	61.4
H-209	Boon Road 7th E of CR 39	1,305.00	62.8
H-210	Boon Road 8th E of CR 39	1,302.00	64.2
H-211	Boon Road 9th E of CR 39	1,301.00	64.8
H-212	Boon Road and CR 41	1,300.00	65.3
H-213	Boon Road 1st E of CR 41	1,298.00	66.3
H-214	Boon Road 2nd E of CR 41	1,297.00	66.8
H-215	Boon Road 3rd E of CR 41	1,297.00	67
H-216	Bus US 131 S of Boon Road	1,294.00	68.5
H-217	Bus US 131 2nd S of Boon Road	1,294.00	68.5

HARING TOWNSHIP  
WATER SYSTEM  
STATIC PRESSURES

Label	Location	Elevation (ft)	Pressure (psi)
H-218	Behind Ames Shopping Plaza	1,295.00	68.1
H-219	Bus US 131 2nd N of Works Ave	1,294.00	68.5
H-220	Bus US 131 Just N of Works Ave	1,294.00	68.6
H-221	Bus US 131 1st S of Works Ave	1,294.00	68.6
H-222	Bus US 131 2nd S of Works Ave	1,294.00	68.6
H-223	Bus US 131 2nd N of Bell Ave	1,294.00	68.6
H-224	Bus US 131 1st N of Bell Ave	1,294.00	68.6
H-225	Bell Ave and Filmore Ave	1,292.00	69.4
H-226	W side Bus US 131 1st Alley S of Bell Ave	1,293.00	69
H-227	Filmore Ave N of Curry Ave	1,291.00	69.9
H-228	Curry Ave and Bus US 131	1,295.00	68.1
H-229	Irma Ave and Bus US 131	1,294.00	68.6
H-230	Alley S of Irma Ave and Bus US 131	1,295.00	68.1
H-232	E side Bus US 131 N of Fox Motors	1,293.00	69
H-233	Easement JC Penney S of Bell Ave	1,294.00	68.6
H-234	Easement S of Bell Ave and E of Bus US 131	1,291.00	69.9
H-235	Bell Ave E of Bus US 131	1,293.00	69
H-236	S of Bell Btw Bus US131 and Hanthorn	1,291.00	69.9
H-237	Bell Ave Btw Bus US131 and Hanthorn	1,291.00	69.9
H-238	Bell Ave W of Hanthorn	1,286.00	71.6
H-239	Bell Ave E of Hanthorn	1,287.00	71.2
H-240	Works Ave Just E of Bus US 131	1,292.00	69.5
H-241	Works Ave Just W of Wellfield	1,292.00	69.5
H-242	Well Line Just N of Works Ave	1,292.00	69.6
H-243	Near NE corner of Big Box Store	1,291.00	70
H-244	W of SW corner of Old Wal-Mart	1,291.00	70
H-245	W of middle of Old Wal-Mart	1,291.00	69.9
H-246	S side of Boon Road E of NW corner of Old Wal-Mart	1,291.00	69.8
H-247	W Side Bus US 131 SE Home Depot	1,297.00	67.2
H-248	SE Corner of Home Depot	1,300.00	65.9
H-249	Rear of Home Depot	1,300.00	65.9
H-250	North Side Home Depot Parcel W of Bus US 131	1,300.00	65.9
H-251	W Side Bus US 131 NE Home Depot Parcel	1,299.00	66.3
H-252	W Side Bus US 131 Mid Home Depot	1,297.00	67.2
H-253	SE corner Meijer	1,297.00	67.2
H-254	NW Corner of Meijer	1,297.00	67.2
H-255	NW side of Meijer	1,297.00	67.2
H-256	NE Corner of Meijer	1,297.00	67.2
H-257	East side of Meijer	1,296.50	67.4
H-258	SE Corner of Meijer	1,296.50	67.4
H-259	South Side Meijer E end	1,297.00	67.2
H-260	S side of Meijer W end	1,297.00	67.2
H-261	Meijer Hydrant N of Convenience Store	1,293.90	68.5
H-262	Meijer Hydrant N and W of Convenience Store	1,292.00	69.4

HARING TOWNSHIP  
WATER SYSTEM  
STATIC PRESSURES

Label	Location	Elevation (ft)	Pressure (psi)
H-263	Meijer S water line a E Property Line	1,289.00	70.7
H-264	Front of ABC Warehouse on West side	1,294.00	68.5
H-265	Front of MC Sport on East side	1,294.00	68.5
H-266	S Water Line ABC Parcel Bwt Miejer & Wal-Mart	1,293.00	68.9
H-267	S Waterline near West Wal-Mart property lline	1,290.00	70.2
H-301	Works Ave just W of Hanthorn St	1,290.00	70.5
H-302	Hanthron St N of Works Ave	1,290.00	70.5
H-303	Easement N of Works Ave and E of Hanthorn St	1,291.00	70.1
H-304	Easement N of Works Ave btw Hanthorn and Plett	1,291.00	70.1
H-305	Works Ave between Hanthorn St and Plett	1,287.00	71.8
H-306	Easement N of Works Ave W of Plett Road	1,291.00	70.1
H-307	Plett Road at Farm Supply	1,291.00	70.1
H-308	W side Plett Rd N of Wal-Mart Convence Store	1,292.00	69.4
H-309	SW Wal-Mart Store Front Corner	1,291.00	69.8
H-310	SE of Wal-Mart front building corner	1,290.00	70.2
H-311	NE of back corner of Wal-Mart	1,289.00	70.7
H-312	SW of Wal-Mart Back corner	1,289.00	70.7
H-313	NE intersection Boon Rd and Plett Rd	1,290.00	70.2
H-314	N side Boon Road at KFC	1,285.00	72.4
H-402	Hanthorn St S of Bell Ave	1,291.00	69.9
H-403	E-W Easement and McKinley St	1,292.00	69.4
H-404	E-W Easement and Harding St	1,294.00	68.6
H-405	Plett Road and E-W Easement	1,294.00	68.6
H-406	Casa Road 4th N of Thirteenth St	1,289.00	70.7
H-407	Casa Road 3rd N of Thirteenth St	1,297.00	67.3
H-408	Casa Road 2nd N of Thirteenth St	1,307.00	62.9
H-409	Casa Road 1st N of Thirteenth St	1,318.00	58.2
H-410	Casa Road and Thirteenth St	1,328.00	53.9
H-1000	Existng Hydrant N Fox Parking	1,293.10	69
H-1001	Existing Hyd Fox Center Parking Lot	1,293.50	68.8
H-1002	Existing Hyd Fox S parking lot	1,293.50	68.8
H-1003	Existing City Hyd E side Bus US131 N. of 13th St	1,294.50	68.4
H-1004	New Hyd N. of Casa Drive	1,289.00	70.7
H-1005	New Hydrant E of US131 on WWTP Site	1,308.00	62.5
H-1006	Hydrant at WWTP	1,301.00	65.5
H-2000	M-55 and US131	1,355.00	42.2

**TAB G**

Fire Flow and Residual Pressure (Modeled) – Haring Township Water System

Label	Location	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)
H-101	Third Ave and Sixteenth St	2,374.71	20
H-102	Third Ave and Fourteenth St	2,024.84	20
H-103	Thirteenth St E of Fourth Ave	1,579.53	20
H-104	Fifteenth St and Fourth Ave	1,967.80	20
H-105	Fourth Ave S of Sixteenth St	2,175.95	20
H-106	Fourth Ave S of Seventeenth St	3,161.85	20.3
H-107	Sixteenth St and Fifth Ave	2,679.49	20
H-108	Fourteenth St and Fifth Ave	2,037.63	20
H-109	Fourteenth St and Sixth Ave	2,642.26	20
H-110	Fourteenth St and Seventh Ave	2,040.54	20
H-111	Seventh Ave N of Fifteenth St	2,398.56	20
H-112	Fifteenth St and Sixth Ave	2,673.48	20
H-113	Sixteenth St and Sixth Ave	2,978.46	20
H-114	Sixth Ave Just N of Seventeenth St	2,632.63	20
H-115	Seventh St and Pine St	2,922.00	21.4
H-116	Pine St between Tenth and Seventh St	2,832.80	22.6
H-117	Tenth Ave and Pine St	2,687.13	20
H-118	Tenth Ave and Majerle St	1,664.90	20
H-119	Majerle St 2nd W of Sixth St	1,470.05	20
H-120	Majerle St 1st W of Sixth St	1,504.99	20
H-121	Majerle St and Sixth St	1,768.14	20
H-122	Sixth Ave at N end	1,083.76	20
H-123	Thirteenth St E of Leeson Ave	2,034.89	20
H-124	Thirteenth St 2nd W of Leeson Ave	2,051.94	20
H-125	CR 39 N of Thirteenth St	2,098.85	20
H-126	CR 39 2nd N of Thirteenth St	2,218.60	20
H-127	N End of CR 39 at Pine St Extended E	2,523.44	20
H-201	CR 39 and Tank Drive	5,000.00	53.5
H-202	CR 39 and Boon Road	5,000.00	51.2
H-203	Boon Road 1st E of CR 39	5,000.00	49.7
H-204	Boon Road 2nd E of CR 39	5,000.00	48.7
H-205	Boon Road 3rd E of CR39	5,000.00	47.3
H-206	Boon Road 4th E of CR 39	5,000.00	47.9
H-207	Boon Road 5th E of CR 39	5,000.00	46.8
H-208	Boon Road 6th E of CR 39	5,000.00	47.6
H-209	Boon Road 7th E of CR 39	5,000.00	48.3
H-210	Boon Road 8th E of CR 39	5,000.00	49.3
H-211	Boon Road 9th E of CR 39	5,000.00	49.7
H-212	Boon Road and CR 41	5,000.00	50.2
H-213	Boon Road 1st E of CR 41	5,000.00	51.3
H-214	Boon Road 2nd E of CR 41	5,000.00	52.2
H-215	Boon Road 3rd E of CR 41	5,000.00	52.8
H-216	Bus US 131 S of Boon Road	5,000.00	55.8
H-217	Bus US 131 2nd S of Boon Road	5,000.00	55.7
H-218	Behind Ames Shopping Plaza	3,418.73	20

## Fire Flow and Residual Pressure (Modeled) – Haring Township Water System

Label	Location	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)
H-219	Bus US 131 2nd N of Works Ave	5,000.00	55.8
H-220	Bus US 131 Just N of Works Ave	5,000.00	56.1
H-221	Bus US 131 1st S of Works Ave	5,000.00	53.3
H-222	Bus US 131 2nd S of Works Ave	4,849.79	51.1
H-223	Bus US 131 2nd N of Bell Ave	4,498.78	48.1
H-224	Bus US 131 1st N of Bell Ave	4,187.52	44.8
H-225	Bell Ave and Filmore Ave	4,024.46	42
H-226	W side Bus US 131 1st Alley S of Bell Ave	2,431.42	20
H-227	Filmore Ave N of Curry Ave	3,947.40	35.5
H-228	Curry Ave and Bus US 131	2,432.36	20
H-229	Irma Ave and Bus US 131	2,572.75	20
H-230	Alley S of Irma Ave and Bus US 131	2,011.98	20
H-232	E side Bus US 131 N of Fox Motors	1,642.57	20
H-233	Easement JC Penney S of Bell Ave	2,647.91	20
H-234	Easement S of Bell Ave and E of Bus US 131	2,734.33	34.9
H-235	Bell Ave E of Bus US 131	3,406.30	35.1
H-236	S of Bell Btw Bus US131 and Hanthorn	2,103.61	24
H-237	Bell Ave Btw Bus US131 and Hanthorn	2,048.56	36
H-238	Bell Ave W of Hanthorn	1,727.24	37.8
H-239	Bell Ave E of Hanthorn	1,625.32	33.2
H-240	Works Ave Just E of Bus US 131	5,000.00	57.5
H-241	Works Ave Just W of Wellfield	5,000.00	58.4
H-242	Well Line Just N of Works Ave	5,000.00	59
H-243	Near NE corner of Big Box Store	2,856.68	20
H-244	W of SW corner of Old Wal-Mart	3,800.76	27.3
H-245	W of middle of Old Wal-Mart	4,998.19	45.3
H-246	S side of Boon Road E of NW corner of Old Wal-Mart	5,000.00	51.7
H-247	W Side Bus US 131 SE Home Depot	4,674.39	40.4
H-248	SE Corner of Home Depot	3,500.97	20
H-249	Rear of Home Depot	4,647.82	39.5
H-250	North Side Home Depot Parcel W of Bus US 131	4,068.51	31.6
H-251	W Side Bus US 131 NE Home Depot Parcel	4,804.32	41.4
H-252	W Side Bus US 131 Mid Home Depot	5,000.00	44.5
H-253	SE corner Meijer	4,797.70	41.7
H-254	NW Corner of Meijer	4,701.66	40.7
H-255	NW side of Meijer	4,316.65	35.8
H-256	NE Corner of Meijer	4,296.66	35.5
H-257	East side of Meijer	4,797.31	41.8
H-258	SE Corner of Meijer	4,821.71	42.1
H-259	South Side Meijer E end	5,000.00	43.9
H-260	S side of Meijer W end	5,000.00	44.7
H-261	Meijer Hydrant N of Convenience Store	4,780.51	42.1
H-262	Meijer Hydrant N and W of Convenience Store	4,469.70	38.6
H-263	Meijer S water line a E Property Line	4,727.10	43.7
H-264	Front of ABC Warehouse on West side	3,188.70	20

## Fire Flow and Residual Pressure (Modeled) – Haring Township Water System

Label	Location	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)
H-265	Front of MC Sport on East side	2,572.35	20
H-266	S Water Line ABC Parcel Bwt Miejer & Wal-Mart	4,513.24	39.1
H-267	S Waterline near West Wal-Mart property lline	4,297.39	37
H-301	Works Ave just W of Hanthorn St	5,000.00	56
H-302	Hanthron St N of Works Ave	3,797.97	27.7
H-303	Easement N of Works Ave and E of Hanthorn St	2,686.48	20
H-304	Easement N of Works Ave btw Hanthorn and Plett	2,293.84	20
H-305	Works Ave between Hanthorn St and Plett	1,270.36	20
H-306	Easement N of Works Ave W of Plett Road	1,985.72	20
H-307	Plett Road at Farm Supply	1,688.33	20
H-308	W side Plett Rd N of Wal-Mart Convence Store	3,963.55	30.5
H-309	SW Wal-Mart Store Front Corner	3,620.18	23.1
H-310	SE of Wal-Mart front building corner	3,542.73	21.1
H-311	NE of back corner of Wal-Mart	3,171.00	20
H-312	SW of Wal-Mart Back corner	3,164.69	20
H-313	NE intersection Boon Rd and Plett Rd	3,769.63	26.6
H-314	N side Boon Road at KFC	3,618.83	23.2
H-402	Hanthorn St S of Bell Ave	1,600.90	36
H-403	E-W Easement and McKinley St	1,567.09	35.6
H-404	E-W Easement and Harding St	1,542.76	34.7
H-405	Plett Road and E-W Easement	1,519.47	34.7
H-406	Casa Road 4th N of Thirteenth St	1,431.25	36.9
H-407	Casa Road 3rd N of Thirteenth St	1,413.64	33.4
H-408	Casa Road 2nd N of Thirteenth St	1,396.62	29.1
H-409	Casa Road 1st N of Thirteenth St	1,380.12	24.4
H-410	Casa Road and Thirteenth St	1,364.74	20
H-1000	Existng Hydrant N Fox Parking	2,101.54	20.6
H-1001	Existing Hyd Fox Center Parking Lot	1,904.02	20.4
H-1002	Existing Hyd Fox S parking lot	1,777.77	20
H-1003	Existing City Hyd E side Bus US131 N. of 13th St	1,334.33	20
H-1004	New Hyd N. of Casa Drive	1,628.05	28.3
H-1005	New Hydrant E of US131 on WWTP Site	1,558.89	20
H-1006	Hydrant at WWTP	1,559.63	21.5
H-2000	M-55 and US131	828.15	20

**TAB H**

## CHEMICAL AND PHYSICAL CLASSIFICATION OF MICHIGAN WATERS

ITEM	EXCELLENT	SATISFACTORY	OBJECTIONABLE	COMMON PROBLEM
Color	0 - 10	10 - 15	over 15	Objectionable
Odor	None	Slight	Strong	Physical
Turbidity	0 - 5	5 - 10	Over 20	Appearance
Total Solids	250	500	Over 1000	Precipitate Scale
Iron - Fe	0 - 0.2	0.3 - 0.5	Over 0.5	Taste - Staining
Manganese - Mn	0	0.10	Over .015	Staining
Calcium - Ca	50	100	Over 250	Hardness
Magnesium - Mg	10	20	Over 40	Hardness
Chlorides - Cl	0 - 10	50	Over 250	Taste - Corrosion
Sodium - Na	10	30	Over 100	Health - Special Diet
Silica - SiO <sub>2</sub>	0 - 5	15	Over 25	Boiler Scale
Sulfate - SO <sub>4</sub>	25	100	Over 250	Taste - Scale
Fluoride - Fl	1.0	0 - 1.5	Over 1.5	Mottling Teeth
Hardness as CaCO <sub>3</sub>	50 - 100	100 - 200	Over 300	Scale - Washing
pH (H-ion)	7.0 8.5	7.0 - 10.5	Under 7.0 Over 10.5	Corrosion
Nitrites	0	0	No Standards	Odor, Taste, Health
Nitrates	0	less 10	Over 10	Health - Infants
Sulfide - H <sub>2</sub> S	0	0	Trace	Odor, Tastes, Corrosion

- ◆ Waters classified as excellent are very good waters for most general purposes.
- ◆ Waters classified as satisfactory are usable without treatment for most purposes.
- ◆ Waters classified as objectionable are usually unsatisfactory for general purposes and frequently may not be usable without treatment.

# TAB I

*Annual*  
**WATER  
QUALITY  
REPORT**

*Reporting Year 2012*



*Presented By*



PWS ID#: 0001030

## There When You Need Us

We are once again proud to present our annual water quality report, covering all testing performed between January 1 and December 31, 2012. Over the years, we have dedicated ourselves to producing drinking water that meets all state and federal standards. We continually strive to adopt new methods for delivering the best quality drinking water to you. As new challenges to drinking water safety emerge, we remain vigilant in meeting the goals of source water protection, water conservation, and community education while continuing to serve the needs of all our water users.

Please remember that we are always available to assist you should you ever have any questions or concerns about your water.



## Community Participation

We want to inform our customers about their water utility. Copies of our operation budget and capital improvement plan are available at the municipal complex and public library. If you would like to tour a facility or learn more about our operations, please call our office to make arrangements.

City council meetings are another good public forum for community participation; feel free to attend one of our regularly scheduled city council meetings on the first and third Mondays of each month, beginning at 7 p.m. at the Municipal Complex, 200 Lake Street, Cadillac, Michigan.

## Substances That Could Be in Water

To ensure that tap water is safe to drink, the U.S. EPA prescribes regulations limiting the amount of certain contaminants in water provided by public water systems. U.S. Food and Drug Administration regulations establish limits for contaminants in bottled water, which must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of these contaminants does not necessarily indicate that the water poses a health risk.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals, in some cases, radioactive material, and substances resulting from the presence of animals or from human activity. Substances that may be present in source water include:

**Microbial Contaminants**, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, or wildlife;

**Inorganic Contaminants**, such as salts and metals, which can be naturally occurring or may result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming;

**Pesticides and Herbicides**, which may come from a variety of sources, such as agriculture, urban stormwater runoff, and residential uses;

**Organic Chemical Contaminants**, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production and may also come from gas stations, urban stormwater runoff, and septic systems;

**Radioactive Contaminants**, which can be naturally occurring or may be the result of oil and gas production and mining activities.

For more information about contaminants and potential health effects, call the U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791.

## Lead in Home Plumbing

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. We are responsible for providing high-quality drinking water but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at [www.epa.gov/safewater/lead](http://www.epa.gov/safewater/lead).

## Source Water Assessment

The 1996 amendments to the Safe Drinking Water Act require that source water assessments be completed for all public water supplies in the United States. In our state, the Michigan Department of Natural Resources and Environment (MDNRE) developed a program to (1) identify areas that supply public drinking water, (2) assess the susceptibility of that supply to actual and potential contamination, and (3) inform the public of the assessment results. Cadillac's assessment was reevaluated in 2005 based on Cadillac's approved Wellhead Protection Program. MDNRE's revised assessment lists the wells with a high to very high susceptibility, based on geology, well construction, well-water chemistry, source isolation, and potential sources of contamination. Copies of the complete source water assessment are available at Cadillac's Municipal Complex and local DNRE office. To learn more about Cadillac's Wellhead Protection Program please visit our Web site at [www.cadillac-mi.net](http://www.cadillac-mi.net).

## Where Does My Water Come From?

Cadillac's water comes from eight water wells owned by the city. Our wells draw groundwater from aquifers 300 and 400 feet below ground. The city's older well field and one-million-gallon water tower were constructed in 1960, ending our reliance on surface water from Lake Cadillac. The most current well field, consisting of three wells, was completed and put online in August of 2012.

Because well water contains varying amounts of iron, a polyphosphate solution is added at each well to try to reduce iron oxide formation in the water system. Chlorine is added to our system to disinfect the water supply.

## Important Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants may be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The U.S. EPA/CDC (Centers for Disease Control and Prevention) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline at (800) 426-4791 or <http://water.epa.gov/drink/hotline>.

## QUESTIONS?

For more information about this report, or for any questions relating to your drinking water, please call the Cadillac Utilities Department at (231) 775-0181.



## Water Main Flushing

**D**istribution mains (pipes) convey water to homes, businesses, and hydrants in your neighborhood. The water entering distribution mains is of very high quality; however, water quality can deteriorate in areas of the distribution mains over time. Water main flushing is the process of cleaning the interior of water distribution mains by sending a rapid flow of water through the mains.

Flushing maintains water quality in several ways. For example, flushing removes sediments like iron and manganese. Although iron and manganese do not pose health concerns, they can affect the taste, clarity, and color of the water. Additionally, sediments can shield microorganisms from the disinfecting power of chlorine, contributing to the growth of microorganisms within distribution mains. Flushing helps remove stale water and ensures the presence of fresh water with sufficient dissolved oxygen, disinfectant levels, and an acceptable taste and smell.

During flushing operations in your neighborhood, some short-term deterioration of water quality, though uncommon, is possible. You should avoid tap water for household uses at that time. If you do use the tap, allow your cold water to run for a few minutes at full velocity before use and avoid using hot water, to prevent sediment accumulation in your hot water tank.

Please contact us if you have any questions or if you would like more information on our water main flushing schedule.

# Q & A

## What is the typical per-day water usage?

While usage varies from community to community and person to person, on average, Americans use 183 gallons of water a day for cooking, washing, flushing, and watering purposes. The average family turns on the tap between 70 and 100 times daily. About 74% of home water usage occurs in the bathroom, about 21% in the laundry room, and about 5% in the kitchen.

## Why do water pipes tend to break in winter?

Liquids generally contract when frozen and become more dense; however, the unique qualities of water cause it to expand by up to 9% when it freezes. That is why water pipes burst when temperatures reach the freezing mark.

## How much water is used to create the food we eat each year?

The average American consumes 1,500 pounds of food each year; 1,000 gallons of water are required to grow and process each pound of that food. Thus, 1.5 million gallons of water is invested in the food eaten annually by just one person! This 200,000-plus cubic feet of water per person is enough to cover a football field four feet deep.

## Is it okay to use hot water from the tap for cooking and drinking?

No, ALWAYS use cold water. Hot water is more likely to contain rust, copper, and lead from household plumbing and water heaters. These harmful substances can dissolve into hot water faster than they do into cold water, especially when the faucet has not been used for an extended period of time.

## What type of container is best for storing water?

Consumer Reports has consistently advised that glass or BPA-free plastics such as polyethylene are the safest choices. To be on the safe side, do not use any container with markings on the recycle symbol showing 7 PC (which is the code for BPA). You could also consider using stainless steel or aluminum containers that have BPA-free liners.

## How much water is used in the shower?

A 10-minute shower can take 25 to 50 gallons of water. High-flow shower heads allow a flow of 6 to 10 gallons a minute. Low-flow shower heads can cut the rate in half without reducing pressure.

## Sampling Results

During the past year, we have taken hundreds of water samples in order to determine the presence of any radioactive, biological, inorganic, volatile organic, or synthetic organic contaminants. The table below shows only those contaminants that were detected in the water.

The state requires us to monitor for certain substances less than once per year because the concentrations of these substances do not change frequently. In these cases, the most recent sample data are included, along with the year in which the sample was taken.

### REGULATED SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Arsenic (ppb)	2012	10	0	1	ND-2	No	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes
Barium (ppm)	2012	2	2	0.04	0.03-0.05	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Chlorine (ppm)	2012	[4]	[4]	1.09	0.01-3.00	No	Water additive used to control microbes
Fluoride (ppm)	2012	4	4	0.13	0.12-0.14	No	Erosion of natural deposits; Discharge from fertilizer and aluminum factories
Haloacetic Acids [HAA] (ppb)	2012	60	NA	7.55	ND-11.9	No	By-product of drinking water disinfection
TTHMs [Total Trihalomethanes] (ppb)	2012	80	NA	23.4	ND-63.2	No	By-product of drinking water disinfection

Tap water samples were collected for lead and copper analyses from sample sites throughout the community

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AL	MCLG	AMOUNT DETECTED (90TH% TILE)	AMOUNT DETECTED AL/TOTAL SITES	VIOLATION	TYPICAL SOURCE
Copper (ppm)	2011	1.3	1.3	0.316	0/30	No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (ppb)	2011	15	0	3.23	0/30	No	Corrosion of household plumbing systems; Erosion of natural deposits

### SECONDARY SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	SMCL	MCLG	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Chloride (ppm)	2012	250	NA	34	22-45	No	Runoff/leaching from natural deposits
Iron (ppb)	2012	300	NA	300	200-400	No	Leaching from natural deposits; Industrial wastes
Sulfate (ppm)	2012	250	NA	7	ND-13	No	Runoff/leaching from natural deposits; Industrial wastes

### OTHER SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
Hardness (ppm)	2012	176	159-193	Erosion of natural deposits
Sodium (ppm)	2012	10	7-13	Erosion of natural deposits

## Definitions

**AL (Action Level):** The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

**MCL (Maximum Contaminant Level):** The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology. Secondary MCLs (SMCLs) are established to regulate aesthetic effects like taste and odor.

**MCLG (Maximum Contaminant Level Goal):** The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

**MRDL (Maximum Residual Disinfectant Level):** The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

**MRDLG (Maximum Residual Disinfectant Level Goal):** The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

**NA:** Not applicable.

**ND (Not detected):** Indicates that the substance was not found by laboratory analysis.

**ppb (parts per billion):** One part substance per billion parts water (or micrograms per liter).

**ppm (parts per million):** One part substance per million parts water (or milligrams per liter).

**TAB J**

# 2012 Water Quality Report for Haring Charter Township

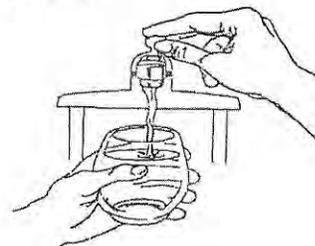
This report covers the drinking water quality for Haring Charter Township for the calendar year 2012. This information is a snapshot of the quality of the water that we provided to you in 2012. Included are details about where your water comes from, what it contains, and how it compares to Environmental Protection Agency (EPA) and State standards.

Your water comes from [2] groundwater wells located at the Haring Township Well Field on Works Avenue. The State performed an assessment of our source water in 2003. The state determined our source water has a Moderate susceptibility to the potential of contamination. A copy of the assessment report is available from the Wexford County Department of Public Works located at 3161 South Lake Mitchell Drive in Cherry Grove Township or the Michigan Department of Environmental Quality located at 120 West Chapin Street in Cadillac.

In the near future, we will be pursuing wellhead protection to safeguard our valuable drinking water source.

- **Contaminants and their presence in water:** Drinking Water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the **EPA's Safe Drinking Water Hotline (800-426-4791)**.
- **Vulnerability of sub-populations:** Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune systems disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

- **Sources of drinking water:** The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. Our water comes from wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.
- Contaminants that may be present in source water include:
  - \* **Microbial contaminants**, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.
  - \* **Inorganic contaminants**, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.
  - \* **Pesticides and herbicides**, which may come from a variety of sources such as agriculture and residential uses.
  - \* **Radioactive contaminants**, which can be naturally occurring or be the result of oil and gas production and mining activities.
  - \* **Organic chemical contaminants**, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can, also, come from gas stations, urban storm water runoff, and septic systems.



In order to ensure that tap water is safe to drink, the EPA prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water which provide the same protection for public health.

## Water Quality Data

The table below lists all the drinking water contaminants that we detected during the 2012 calendar year. The presence of these contaminants in the water does not necessarily indicate that the water poses a health risk. Unless otherwise noted, the data presented in this table is from testing done January 1 – December 31, 2012. The State allows us to monitor for certain contaminants less than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. All of the data is representative of the water quality, but some are more than one year old.

### Terms and abbreviations used below:

- **Maximum Contaminant Level Goal (MCLG):** The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.
- **Maximum Contaminant Level (MCL):** The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
- **Maximum Residual Disinfectant Level (MRDL):** The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
- **Maximum Residual Disinfectant Level Goal (MRDLG):** The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
- **N/A:** Not applicable
- **ND:** not detectable at testing limit
- **ppb:** parts per billion or micrograms per liter
- **ppm:** parts per million or milligrams per liter
- **pCi/l:** picocuries per liter (a measure of radioactivity).
- **Action Level:** The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.
- **RAA:** Running Annual Average; this is an annual average of the previous four quarter averages for a test result.

### Samples Collected at the Well House:

Radioactive Data	MCL	MCLG	Our Water	Sample Date	Violation Yes / No	Typical Source
Alpha emitters (pCi/L)	15	0	2.9 to 5.8	2010	No	Erosion of natural deposits
Combined radium 226 / 228 (pCi/L)	5	0	0.37 to 0.47	2010	No	Erosion of natural deposits

Secondary Substances	Our Water	Sample Date	Violation Yes / No	Typical Source
Chloride (ppm)	19	2012	N/A	Erosion of natural deposits
Iron (ppb)	500	2012	N/A	Erosion of natural deposits

Unregulated Substances <sup>1</sup>	Our Water	Sample Date	Violation Yes / No	Typical Source
Sodium (ppm)	9	2012	N/A	Erosion of natural deposits

<sup>1</sup> Unregulated substances are those for which EPA has not established drinking water standards. Monitoring helps EPA to determine where certain contaminants occur and whether it needs to regulate those contaminants.

### Samples Collected in the Distribution System:

Regulated Substances	MCL	Our Water	Sample Date	Violation Yes / No	Typical Source
Lead (ppb) <sup>2</sup>	AL = 15	3.8	2010	No	Corrosion of household plumbing systems; Erosion of natural deposits
Copper (ppm) <sup>2</sup>	AL = 1.3	0.091	2010	No	Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives
Barium (ppm)	MCL = 2 MCLG = 2	0.02	2006	No	Discharge of drilling wastes; Erosion of natural deposits
Free Chlorine Residual (ppm)	MRDL = 4.0 MRDLG = 4	RAA = 0.13 Range = 0.06 to 0.28	Monthly	No	Water additive used to control microbes
Total * Trihalomethanes TTHM (ppb)	80	RAA = 58 Range = 48 to 65	2012	No	By-product of drinking water chlorination
Haloacetic Acids* HAA5 (ppb)	60	RAA = 22 Range = 19 to 29	2012	No	By-product of drinking water chlorination

<sup>2</sup> 90% of the samples collected were at or below the level reported for our water. Tap water samples for lead and copper analyses are collected from sample sites throughout the community.

\* Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer. Testing for Trihalomethanes and Haloacetic Acids is required under the Disinfectant - Disinfectant By-Products Rule.

Microbial Contaminants	MCL	MCLG	Positive Samples	Violation Yes / No	Typical Source
Total Coliform Bacteria	1 positive monthly sample (5% of monthly samples positive)	0	0	No	Naturally present in the environment
Fecal Coliform and <i>E. coli</i>	Routine and repeat samples are total coliform positive, and one is also fecal or <i>E. coli</i> positive	0	0	No	Human and animal fecal waste

**Monitoring & Reporting Requirements:** The State and EPA require us to test our water on a regular basis to ensure its safety. We met all the monitoring and reporting requirements for the 2012 Consumer Confidence Report.

We invite public participation in decisions that affect drinking water quality. **The Board of Public Works meets monthly on the second Tuesday of month at 6:00 p.m.** The meetings are held at the DPW office. For more information about your water, or the contents of this report, contact John Divozzo at (231) 775 -0155. For more information about safe drinking water, visit the U.S. Environmental Protection Agency at [www.epa.gov/safewater](http://www.epa.gov/safewater).