HOPKINS TOWNSHIP
DOWNTOWN DEVELOPMENT AUTHORITY

THE TAX INCREMENT FINANCING AND DEVELOPMENT PLAN

Adopted by Hopkins Township DDA Board: _____

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INTRODUCTION

On July 29, 2020 the Township Board for the Township of Hopkins (the "Township") adopted Ordinance No. 2-2020, which established the Hopkins Township Downtown Development Authority (DDA). Ordinance No. 2-2020 also designated the boundaries of the downtown district within which the DDA may legally work (the "Downtown District"). The Ordinance is attached as Exhibit A.

SECTION I. TAX INCREMENT FINANCING PLAN

A. AN EXPLANATION OF THE TAX INCREMENT PROCEDURE.

Tax increment financing is a method by which a municipality may finance development in areas in an effort to enhance and protect against stagnation or decline in property values. Tax increments, under Act 57 of the Public Acts of Michigan of 2018 ("Act 57"), are the property taxes that are generated by the increase in assessed value in a particular year over the assessed value in a beginning, or initial year. Act 57 allows a municipality to establish a Downtown Development Authority (the "Authority"), which may operate within its Downtown District, and to adopt a plan to use tax increment revenues for public improvements within an area designed in the Plan (the "Development Area"). The Plan which an Authority may adopt includes a tax increment financing plan (the "TIF Plan") and a development plan (the "Development Plan") (the TIF plan and the Development plan referred to jointly as the "TIF Development Plan"), and, after adoption of a TIF Development Plan by the municipality, the Authority may capture tax increment revenues attributable to any increases in the value of real and personal property within the Development Area. These increases in property value may be attributable to new construction, rehabilitation, remodeling, alteration, additions, inflation or any other factors the Assessor may deem relevant.

Once a TIF Development Plan has been adopted, the most recent taxable value, of all Personal and Real taxable property within the area in which certain development will take place is called the "initial taxable value." In each year after the TIF Development Plan is adopted, the total taxable value of real and personal property within the Development Area is referred to as the "current taxable value." The difference between the current and initial assessed values in each year is known as the "captured Taxable value." The property tax revenue attributable to the captured taxable value of properties within the Development Area is known as "tax increment revenue." Property which is exempt from taxation is given an initial assessed value of zero.

While the TIF Development Plan is in force, local taxing jurisdictions continue to receive the full amount of tax revenues attributable to the initial taxable value of all property within the Development Area. If properties within the Development Area increase in value, however, those tax revenues attributable to this increase are transferred to the Authority for expenditure according to the TIF Development Plan. Pursuant to the TIF Development

Plan, tax increment revenues are used to finance development which increases property values and stimulates investment in the Development Area.

This TIF Plan provides for the use of all of the captured tax increments. The DDA shall expend the tax increments received for the development program only in accordance with the TIF Plan. Tax increment revenues in excess of the estimated tax increment revenues or in excess of the actual cost of the Plan to be paid by the tax increment revenues may be retained by the DDA only for purposes that, by resolution of the DDA Board, are determined to further the development program in accordance with the Plan. The excess revenue not so used shall revert proportionately to the respective taxing jurisdictions. These revenues shall not be used to circumvent existing property tax laws or a local charter, which provides a maximum authorized rate for the levy of property taxes.

Unless the DDA with the approval of the Hopkins Township Board decides to levy a millage, taxpayers shall see no change in their tax bills, rates of taxation or methods of payment. Tax increment financing mandates the transfer of tax increment revenues by municipal and county treasurers to authorities created under the Act in order to effectuate the legislative government programs to eliminate property value deterioration and to promote economic growth. The way in which a downtown development authority makes use of the tools made available depends on the problems and priorities of each community. This Plan has been developed within the purposes of Act 57 and the problems and priorities as perceived by the Hopkins Township DDA and as submitted for the approval of the Hopkins Township Board of Trustees.

The Township may accept tax increment revenues from the DDA to reimburse it for expenses incurred in the preparation and adoption of this Plan. The purposes of the projects defined in the Development Plan include promoting safer vehicular movements; improving the pedestrian circulation system; augmenting the appearance of the Development Area; providing landscaping as a beautifying agent; and encouraging the economic revitalization of the Development Area. The Development Plan sets forth development projects to be financed by this Plan in whole or in part. Other financing mechanisms may include donations to the DDA, tax increments, monies borrowed, grants, or other funding sources as contained in Act 57.

B. MAXIMUM AMOUNT OF BONDED INDEBTEDNESS TO BE INCURRED.

MCL 125.4213 states that, "[t]he authority may borrow money and issue its negotiable revenue bonds under the revenue bond act of 1933, 1933 PA 94, MCL 141.101 to 141.140." The Township by majority vote of the members of its Township Board may pledge its full faith and credit to support the authority's revenue bonds. *Id*. The maximum amount of bonded indebtedness to be incurred under this TIF Plan shall only be with Township Board approval and not greater than 30 times the district annual revenue or as otherwise provided for by law. Bonds issued to finance the cost of the improvements contained in this TIF Plan and Development Plan may be issued in any form authorized under Act 57 or permitted by law.

C. DURATION OF THE PROGRAM.

This plan is in effect until dissolved by recommendation of the DDA Board and the approval of the Hopkins Township Board. While the Plan may be terminated, the plan shall not be terminated before the Authority has collected tax increment revenues in such sum as shall fully pay for the construction of the projects or has otherwise provided for the payment of the projects, and the Plan will not be terminated before the principal and interest on any bonds which are outstanding have been paid in full, or funds sufficient for such payment have been segregated.

D. ESTIMATED IMPACT OF THE TAX INCREMENT FINANCING PLAN UPON THE REVENUES OF HOPKINS TOWNSHIP AND ALLEGAN COUNTY

As of the adoption of the original plan, initial base value of the Development Area is $6,127,492. The taxable value of the Development Area in 2020 is $6,127,492, accounting for a captured value of $121,082. When this TIF Development Plan has terminated these taxing jurisdictions will receive property tax revenues arising from all taxable property located within the Development Area, including new development and appreciation in value stimulated by the development projects.

Without regard for special voted millage, each taxing jurisdiction levies the following millages on property within the Development Area: Hopkins Township, 5.7 mills, Allegan County, 7.193 mills, Wayland schools 26.4 mills, Allegan Intermediate School District 4.9405, State Ed Tax 6 Mills, and Hopkins District Library .60 mills.

E. USE OF TAX INCREMENT REVENUE

The tax increment revenue paid to the DDA by the municipal and county treasurers is to be disbursed by the DDA from time to time in such manner as the DDA may deem necessary and appropriate in order to carry out the purposes of the Development Plan, including but not limited to the following:

1. The principal, interest and reserve payments required for any bonded indebtedness to be incurred in its behalf for purposes provided in the Development Plan.

2. Cash payments for initiating and completing any improvements or activity called for in the Development Plan

3. Any annual operating deficits, that the DDA may incur from acquired and/or leased property in the Development Area.

4. Interest payments on any sums that the DDA should borrow before or during the construction of any improvement or activity to be accomplished by the Development Plan, after approval by Hopkins Township.

5. Payments required to establish and maintain a capital replacement reserve.

6. Payments required to establish and maintain a capital expenditure reserve.

7. Payments required to establish and maintain any required sinking fund.

8. Payments to pay the costs of any additional improvements to the development area that are determined necessary by the DDA and approved by Hopkins Township.

9. Any administrative expenditure required to meet the cost of operation of the DDA and to repay any cash advances provided by the Hopkins Township. This may include quarterly payments to the Township to support overhead expenses.

10. The DDA may modify the priority of projects and payments at any time if, within its discretion, such modification is necessary to facilitate the development plan then existing and is permitted under the term of any outstanding indebtedness.

11. See Exhibit C for the estimated impact of the capture of tax increment revenues.

SECTION II. DEVELOPMENT PLAN

This Development Plan includes projects to be carried out by the Authority. The objectives of the Development Plan are to promote safer vehicular movements; improve the pedestrian circulation system; augment the appearance of the Development Area; provide landscaping as a beautifying agent; and encourage the economic revitalization of the Development Area. Promote and provide sewer, water, storm drainage and road improvements. Each project helps to accomplish the objectives.

A. BOUNDARIES OF THE DEVELOPMENT AREA.

The boundaries of the Development Area are the same as those of the Downtown District. The boundaries are illustrated in Exhibit A. The Development Area is the area to which the Development Plan applies.

B. EXISTING OR NEW STREETS AND OTHER PUBLIC FACILITIES WITHIN THE DEVELOPMENT AREA, EXISTING AND PROPOSED LAND USES WITHIN THE DEVELOPMENT AREA.

Existing or new streets, public facilities and land uses within the Development Area, and proposed land uses are:

1. Streets. The Development Area, as originally established included the following public streets:
   - 12th Street from 128th Avenue to 135th Avenue
   - 13th Street from 128th Avenue to 135th Avenue

2. Public facilities. New public facilities within the Development Area include, but not limited to, parking lots, streets, sidewalks, a right of way for an alley, utility lines and easements, a cemetery, a library and the township hall and fire barn.

3. Current land uses. Present private land uses within the Development Area include agriculture, commercial, residential, land. Present public land uses in the Development Area include roads; approximate acreages of land uses are as follows:
   - Agricultural- 860 acres
   - Commercial- 160 acres
   - Industrial- 1 acre
   - Institutional- 0 acres
   - Residential- 93 acres
   - Rights-Of-Way- 71 acres

4. Proposed land uses. There will be no changes in public or private land use within the development area resulting directly from the Development Plan. However, it is the intent of this Development Plan to generate private sector interest in the Development Area, ultimately resulting in new private investment.

5. Boundaries of Development Area. The Development Area includes the portions of the Development Area approved in 2020.

   Property located in Hopkins Township, Allegan County, Michigan and described as follows:

   Legal description: See exhibit A

C. EXISTING IMPROVEMENTS TO THE DEVELOPMENT AREA TO BE DEMOLISHED, REPAIRED OR ALTERED, A DESCRIPTION OF ANY SUCH REPAIRS OF ALTERATIONS, AND AN ESTIMATE OF THE TIME NEEDED FOR COMPLETION.

None.

D. LOCATION, EXTENT, CHARACTER AND ESTIMATED COST OF THE PLANNED IMPROVEMENTS, INCLUDING REHABILITATION, AND AN ESTIMATE OF THE TIME REQUIRED FOR COMPLETION.

The planned improvements consist of those described in Section II.D. It is estimated that approximately $20,610,000 and 40 years would be required.

E. STATEMENT OF THE CONSTRUCTION OR STAGES OF CONSTRUCTION PLANNED AND ESTIMATED TIME REQUIRED FOR COMPLETION OF EACH STAGE:

Item No.	Extent and Character	Estimated Cost	Potential Completion
1	Hire Professional services to apply for grants, loans, bonds, and to setup a special assessment area.	$50,000	2021-2022
2	On 12th street properties provide sewer, water, storm drainage, Extension of natural gas and high-speed internet	$18,000,000	2021-2060
3	Construct and build 12th Street for 128th to 135th Ave to an all-season road.	$2,000,000	Ongoing
4	Convert overhead electrical to underground electrical	$300,000	Ongoing
5	Purchase, install and maintain decorative street lighting from on 12th Street from 128th to 135th	$100,000	Ongoing
6	Purchase land, install and maintain clock tower at community gateway.	$130,000	Ongoing
7	Install gateways signage at Township gateways and beautify gateways with landscaping and other plant materials	$10,000	Ongoing
8	Develop logo and marketing materials for Hopkins DDA	$20,000	Ongoing
	Total	$20,610,000	As Identified

Phase One: Hire Professional services to apply for grants, loans, bonds, to funds project. Work with the Hopkins Township Board to establish a special assessment district with in the DDA district to assess revenue to construct sewer plant and to purchase, install collection lines and lift stations.

Phase Two: Work with Allegan County Road Commission to Construct primary road on 12th Street from 135th Avenue to 129th Avenue.

Phase Three: Convert overhead electrical to underground. Purchase, install and maintain decorative street lighting from on 12th Street from 128th to 135th electrical. Purchase land, install and maintain

clock tower at community gateway. Install gateways signage at Township gateways and beautify gateways with landscaping and other plant materials. Develop logo and marketing materials for Hopkins DDA.

F. DESCRIPTION OF ANY PARTS OF THE DEVELOPMENT AREA TO BE LEFT AS OPEN SPACE AND THE USE CONTEMPLATED FOR THE SPACE.

None.

G. DESCRIPTION OF ANY PARTS OF THE DEVELOPMENT AREA THAT THE AUTHORITY DESIRES TO SELL, DONATE, EXCHANGE, OR LEASE TO OR FROM THE TOWNSHIP AND PROPOSED TERMS.

None.

H. DESIRED ZONING CHANGES AND CHANGES IN STREETS, STREET LEVELS, INTERSECTIONS AND UTILITIES

The DDA may work collaboratively with the Hopkins Township Planning Commission and Township Board to recommend revisions to the Hopkins Township Zoning Ordinance to establish design standards for the Development Area. The Township Board has the legislative authority to approve or deny amendments to the Township Zoning Ordinance.

I. ESTIMATED COST OF THE DEVELOPMENT AND A STATEMENT OF THE PROPOSED METHOD OF FINANCING AND THE AUTHORITY'S ABILITY TO ARRANGE THE FINANCING.

The total estimated cost of professional services to assist with applications for grants and other revenue sourcing is $50,000. Actual improvement costs are estimated to be an additional 20,560,000. Revenues to support all costs shall be derived from any of the following sources, or from a combination of these sources:

1. The issuance of one or more series of revenue bonds which may be supported by a limited tax pledge if authorized by resolution of the Hopkins Township Board of Trustees, or if authorized by the voters of the Township, the unlimited tax, full faith and credit of the Township;

2. Tax increment bonds of the DDA which are secured by tax increment revenue to be received from property within the Development Area or tax increment bonds of the Township which are secured by tax increment revenue and by a limited tax pledge of Hopkins Township if authorized by resolution of the Hopkins Township Board of Trustees, or if authorized by the voters of the Hopkins Township, the unlimited tax, full faith and credit of the Hopkins Township;

3. Municipal securities or obligations issued by Hopkins Township on behalf of the DDA;
4. Other municipal securities issued by the DDA;
5. Funds borrowed from the Hopkins Township at rates and terms to be agreed upon or as set forth elsewhere in the Development Plan and Tax Increment Financing Plan; and,
6. Cash.
7. The DDA may work with the Hopkins Township Board to establish a special assessment to generate revenue to pay for any legal needs for all or part of the DDA area.

   Tax collections expected to be generated by the captured assessed value of property within the Development Area are expected to be adequate to provide for payment of principal and interest on bonds or funds borrowed from the Township.

   The amounts of bonded indebtedness or indebtedness to be incurred by the DDA and/or the Township for all bond issues or loans including payments of capitalized interest, principal and required reserve shall be determined by the Township, upon the recommendations of the DDA.

J. PERSONS TO WHOM ALL OR A PORTION OF THE DEVELOPMENT IS TO BE LEASED, SOLD, OR CONVEYED, AND FOR WHOSE BENEFIT THE PROJECT IS BEING UNDERTAKEN.

The projects are entirely public projects and will be owned by the Township, unless otherwise indicated through an inter-local agreement, or as otherwise authorized by law. The development projects are being undertaken for the benefit of the citizens of Hopkins Township to eliminate and prevent blight and to encourage economic development and revitalization.

K. PROCEDURES FOR BIDDING FOR THE LEASING, PURCHASING OR CONVEYING OF ALL OR A PORTION OF THE DEVELOPMENT, ABSENT A PRIOR AGREEMENT TO DO SO.

Not applicable.

L. ESTIMATED NUMBER OF PERSONS RESIDING IN THE DEVELOPMENT AREA AND THE NUMBER OF FAMILIES AND INDIVIDUALS TO BE DISPLACED.

At the present time it is estimated that less than 100 persons reside in the Development Area. No families or individuals are to be displaced by the project. No occupied residences will be acquired or demolished by the Authority.

M. PLAN OF PRIORITY FOR RELOCATION OF DISPLACED PERSONS IN ANY NEW HOUSING WITHIN THE DEVELOPMENT AREA.

None. No person will be displaced within the Development Area.

N. PROVISIONS FOR THE COSTS OF RELOCATING DISPLACED PERSONS.

No person will be displaced by the development. A plan pursuant to Act No. 227 of 1972 is not applicable.

O. PLAN IS IN COMPLIANCE WITH PUBLIC ACTS OF 57 of 2018.

This Development Plan satisfies the provisions of Public Act 57 of 2018.

P. TRANSMITTING AND EXPENDING TAX INCREMENTS REVENUES; REVERSION OF SURPLUS FUNDS; ABOLISHMENT OF TAX INCREMENT FINANCING PLAN; CONDITIONS.

The Township and County Treasurers shall transmit to the authority tax increment revenues. The Authority shall expend the tax increment revenues received for the development program only pursuant to the tax increment financing plan. Surplus funds shall revert proportionately to the respective taxing bodies. These revenues shall not be used to circumvent existing property tax limitations. The governing body of the municipality may abolish the tax increment financing plan when it finds that the purposes for which it was established are accomplished. The tax increment financing plan shall not be abolished, allowed to expire, or otherwise terminate until the principal of, and interest on, bonds issued pursuant to section 216 of PA 57 of 2018 have been paid or funds sufficient to make the payment have been segregated.

Q. ANY OTHER INFORMATION THE DDA BOARD DEEMS RELEVANT.

HOPKINS TOWNSHIP

ALLEGAN COUNTY, MICHIGAN

ORDINANCE NO. 2-2020

DOWNTOWN DEVELOPMENT AUTHORITY ORDINANCE

ADOPTED: July 29, **2020**

EFFECTIVE: Upon Publication after adoption, **2020**

An ordinance to establish a Downtown Development Authority in Hopkins Township.

THE TOWNSHIP OF HOPKINS
ALLEGAN COUNTY, MICHIGAN
ORDAINS:

SECTION 1
TITLE

This Ordinance shall be known and cited as the Hopkins Township Downtown Development Ordinance.

SECTION 2
DEFINITIONS

The terms used in this Ordinance shall have the same meaning as given to them in Act 57 or hereinafter in this section provided, unless the context clearly indicates to the contrary. As used in this Ordinance:

Act 57 means Act No. 57 of the Public Acts of Michigan of 2018, as now in effect or hereinafter amended.

Authority means the Hopkins Township Downtown Development Authority created by this Ordinance.

Board or Board of Directors means the Board of Directors of the Authority, the governing body of the Authority.

Chief Executive Officer means the Supervisor of the Township.

Downtown District means the Downtown District designated by this Ordinance as now existing or hereafter amended.

Township means the Hopkins Township, Allegan County, Michigan.

Township Board means the Township Board of Hopkins Township.

SECTION 3
DETERMINATION OF NECESSITY

The Township Board hereby determines that it is necessary for the best interests of the public and the Township to halt property value deterioration and increase property tax valuation where possible in the downtown business district of the Township, to eliminate the causes of deterioration and to promote economic growth by establishing a downtown development authority pursuant to Act 57.

SECTION 4
CREATION OF THE AUTHORITY

There is hereby created pursuant to Act 57 a Downtown Development Authority for the Township. The Authority shall be a public body corporate and shall be known as and exercise its powers under the title of "Hopkins Township Downtown Development Authority". The Authority may adopt a seal, may sue and be sued in any court of this State and shall possess all of the powers necessary to carry out the purpose of its incorporation as provided by this Ordinance and Act 57. The enumeration of a power in this Ordinance or in Act 57 shall not be construed as a limitation upon the general powers of the Authority.

SECTION 5
DESCRIPTION OF THE DOWNTOWN DISTRICT

The Downtown District in which the Authority shall exercise its powers as provided by Act 57 shall consist of the described territory in the Township, subject to this Ordinance and Act 57, as set forth in Exhibit A, attached hereto and made a part hereof.

SECTION 6
BOARD OF DIRECTORS

The Authority shall be under the supervision and control of the Board of Directors consisting of the Chief Executive Officer of the Township and not less than eight or more than twelve members as determined by the Township Board. The members shall be appointed by the Chief Executive Officer of the Township, subject to the approval by the Township Board. If the Township has a population of less than 5000, it may cause it's Planning Commission to serve as downtown development authority board. If the Township Board does not select it's Planning Commission, then not less than a majority of the members shall be persons having interest in property located in the Downtown District. Not less than one of the members shall be a resident of the Downtown District, if the Downtown District has 100 or more persons residing within it. Of the members first appointed, an equal number, as near as is practical, shall be appointed for one year, two

years, three years and four years. Members shall hold office until the members' successor is appointed. Thereafter, each member shall serve for a term of four years. An appointment to fill a vacancy shall be made by the Chief Executive Officer of the Township for the unexpired term only. Members of the Board shall serve without compensation but shall be reimbursed for actual and necessary expenses.

SECTION 7
POWERS OF THE AUTHORITY

The Authority shall have all powers enumerated or implied by law in Act 57.

SECTION 8
FISCAL YEAR; ADOPTION OF BUDGET

A. The fiscal year of the Authority shall begin on April 1 of each year and end on March 31 of the same year, or such other fiscal year as may hereafter be adopted by the Township.
B. The Board shall annually prepare a budget and shall submit it to the Township Board on the same date that the proposed budget for the Township is required by law to be submitted to the Township Board. The Board shall not finally adopt a budget for any fiscal year until the budget has been approved by the Township Board. The Board may, however, temporarily adopt a budget in connection with the operation of any improvements which have been financed by revenue bonds were required to do so by the Ordinance authorizing the revenue bonds.
C. The Authority shall be audited by the same independent auditors auditing the Township. Copies of the audit report shall be filed with the Township Board.

SECTION 9
DISSOLUTION

Upon completion of the purpose, the Authority may be dissolved by an ordinance duly adopted by the Township Board. The property and assets of the Authority, after dissolution and satisfaction of its obligations, shall revert to the Township.

SECTION 10

SECTION HEADINGS; SEVERABILITY; REPEALER

Section headings in this Ordinance are furnished for convenience only and shall not be considered to be part of this Ordinance. All other Ordinances, resolutions and orders or parts thereof in conflict with the provisions of this Ordinance are, to the extent of such conflict, hereby repealed, and each section of the Ordinance and each subdivision of any section thereof is hereby declared to be independent, and the finding or holding of any section of subdivision thereof to be invalid or void shall not be deemed or held to affect the validity of any other section or subdivision.

SECTION 11
PUBLICATION, RECORDING AND EFFECTIVE DATE

This Ordinance is hereby determined by the Township Board to be immediately necessary for the interests of the Township and shall be in full force and effect upon publication after adoption.

CERTIFICATE OF AUTHENTICITY

I, Eric Alberda, the duly elected Clerk of Hopkins Township, hereby certify that the foregoing Ordinance Amendment was adopted by the Township Board of said Township at the Special meeting of said Board on Wednesday, July 29, 2020 at which meeting a quorum was present. The foregoing Ordinance Amendment was offered by Board Member Chuck Wamhoff

and supported by Board Member Eric Alberda

Upon roll call vote, the following voted aye:

Modreske Morris Alberda Wamhoff Evans

And the following voted nay:

Modreske Morris Alberda Wamhoff Evans

Eric Alberda, Hopkins Township Clerk

7-29-2020

Date

TOWNSHIP OF HOPKINS
ALLEGAN COUNTY, MICHIGAN
AN ORDINANCE CREATING THE HOPKINS TOWNSHIP DOWNTOWN DEVELOPMENT AUTHORITY AND DESIGNATING BOUNDARIES OF THE DOWNTOWN DISTRICT

The shaded portion of the map below depicts the proposed boundaries of the Downtown District. The proposed boundaries of the Downtown District include the following parcel numbers located within the Township:

03-10-001-018-00	03-10-012-005-00	03-10-013-002-50	03-10-012-022-00
03-10-001-018-30	03-10-012-008-00	03-10-013-008-00	03-10-012-024-10
03-10-001-018-50	03-10-001-018-20	03-10-013-009-20	03-10-013-002-00
03-10-001-020-00	03-10-001-018-41	03-10-024-001-00	03-10-013-007-00
03-10-001-022-00	03-10-001-019-00	03-10-024-003-10	03-10-013-009-10
03-10-012-001-10	03-10-001-021-30	03-10-012-011-00	03-10-013-010-00
03-10-012-003-00	03-10-012-001-00	03-10-012-019-00	03-10-024-003-00
03-10-012-003-40	03-10-300-005-10	03-10-012-021-00	03-10-024-004-20
03-10-012-004-10	03-10-012-002-10	03-10-012-024-00	03-10-024-005-00
03-10-012-007-00	03-10-012-003-20	03-10-013-001-10	03-10-024-008-00
03-10-001-018-10	03-10-012-004-00	03-10-013-006-00	03-10-300-001-00
03-10-001-018-40	03-10-012-006-00	03-10-013-009-00	03-10-300-004-00
03-10-001-018-60	03-10-012-009-00	03-10-013-009-30	03-10-300-006-00
03-10-001-021-00	03-10-012-010-00	03-10-024-002-00	03-10-024-006-00
03-10-001-901-01	03-10-012-011-20	03-10-024-004-10	03-10-025-001-00
03-10-012-002-00	03-10-012-020-00	03-10-012-011-10	03-10-300-002-00
03-10-012-003-10	03-10-012-023-00	03-10-012-019-10	03-10-300-005-00
03-10-012-003-50	03-10-013-001-00	03-10-024-007-00	03-10-025-001-10
03-10-300-003-00			

The proposed Downtown District is legally described as:

LAND BEING PART OF TOWN 3 NORTH, RANGE 12 WEST, HOPKINS TOWNSHIP, ALLEGAN COUNTY, MICHIGAN MORE PARTICULARLY DESCRIBED AS:

ALL THAT PART OF THE SOUTHEAST 1/4 OF SECTION 1 LYING WEST OF THE WEST RIGHT OF WAY LINE OF HIGHWAY US-131

AND ALL THAT PART OF THE EAST 1/2 OF SECTION 12 LYING WEST OF THE WEST RIGHT OF WAY LINE OF HIGHWAY US-131

AND ALL THAT PART OF THE EAST 1/2 OF SECTION 13 LYING WEST OF THE WEST RIGHT OF WAY OF HIGHWAY US-131

AND THE SOUTHEAST 1/4 OF THE NORTHWEST 1/4 OF SECTION 13, EXCEPT THE EAST 264 FEET OF THE SOUTH 660 FEET

AND ALL THAT PART OF THE EAST 1/2 OF SECTION 24 LYING WEST OF THE WEST OF THE WEST RIGHT OF WAY LINE OF HIGHWAY US-131, EXCEPT PARCEL NUMBER 0310-024-004-00 WHICH IS THE LAND HELD IN TRUST FOR THE MATCH-E-BE-NASH-SHE-WISH BAND OF POTTAWATOMI INDIANS AND DESCRIBED AS FOLLOWS: BEGINNING AT THE EAST 1/4 CORNER POST THENCE WEST 1653 FEET ALONG THE EAST & WEST1/4 LINE; THENCE

SOUTH 319 FEET; THENCE WEST 344 FEET; THENCE NORTH 319 FEET TO THE EAST & WEST 1/4 LINE; THENCE WEST TO THE CENTER OF SECTION 24; THENCE SOUTH ALONG THE NORTH & SOUTH 1/4 LINE TO THE SOUTH SECTION LINE; THENCE EAST ALONG SAID SOUTH SECTION LINE TO A POINT 1320 FEET WEST OF THE EAST SECTION LINE; THENCE NORTH 660 FEET; THENCE EAST 1320 FEET TO THE EAST SECTION LINE; THENCE NORTH ALONG SAID SECTION LINE 530.9 FEET THENCE WEST 200 FEET; THENCE NORTH 383.6 FEET TO A POINT ON THE SOUTH EDGE OF PIERCE DRAIN; THENCE SOUTH 75 DEGREES EAST 207.06 FEET ALONG SAID SOUTH EDGE OF SAID DRAIN TO THE EAST SECTION LINE; THENCE NORTH ALONG SAID SECTION LINE TO THE POINT OF BEGINNING; EXCEPT US HWY 131

AND THE NORTH 1/2 OF THE NORTHEAST 1/4 OF SECTION 25 LYING WEST OF THE WEST RIGHT OF WAY LINE OF HIGHWAY US-131

AND THE EAST 33 FEET OF THE WEST 1/2 OF SECTIONS 12, 13 AND 24, AND ALSO THE EAST 33 FEET OF THE SOUTHWEST 1/4 OF SECTION 1, AND ALSO THE EAST 33 FEET OF THE NORTH 1/2 OF THE NORTHWEST 1/4 OF SECTION 25, BEING THE WEST HALF OF 13TH STREET FROM THE CENTER OF SECTION 1 TO THE SOUTH LINE OF THE NORTH 1/2 OF THE NORTH 1/2 OF SECTION 25.

Parcel No. 0310-024-004-00 is description of the land in trust that is excepted out of the proposed Downtown District boundaries and is legally described as:

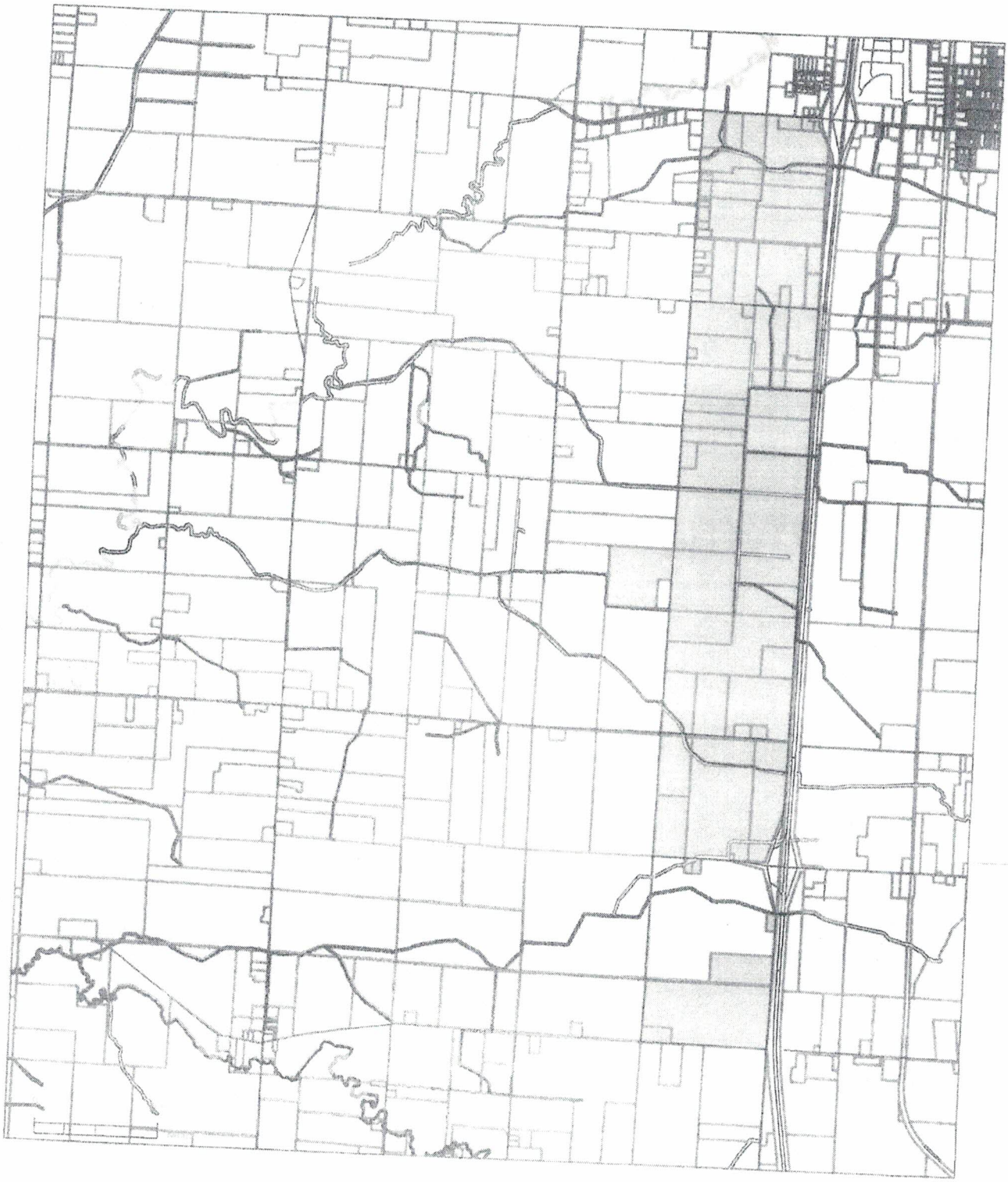
COM AT E 1/4 COR PST TH W 1653' ALG E & W 1/4 LIN TH S 319' TH W 344' TH N 319' TO E & W 1/4 LIN TH W TO CTR OF SEC TH S ALG N & S 1/4 LIN TO S SEC LIN TH E ALG SD S SEC LIN TO A PT 1320' W OF E SEC LIN TH N 660' TH E 1320' TO E SEC LIN TH N ALG SD SEC LIN 530.9' TH W 200' TH N 383.6' TO A PT ON S EDGE OF PIERCE DRAIN TH S 75 DEG E 207.06' ALG SD S EDGE OF SD DRAIN TO E SEC LIN TH N ALG SD SEC LIN TO POB EX US HWY 131 SEC 24 T3N R12W (2001)

Below is the description for the parcel that is on the eastside of 13th street. This is one parcel that has a description on both sides of 13th street. For taxing reasons, the whole parcel will be in the DDA district:

Parcel No. 0310-013-002-00:

SW 1/4 NE 1/4 ALSO SE 1/4 NW 1/4 SEC 13 EX THE E 264' OF S 660' SE 1/4 NW 1/4 SEC 13 T3N R12W (86)

HOPKINS TWP 2020 MAP



TELEPHONIC SPECIAL BOARD MEETING NOTICE
HOPKINS TOWNSHIP BOARD OF TRUSTEES
ALLEGAN COUNTY, MICHIGAN

Wednesday, July 29, 2020
7:30 p.m.

To: The residents and property owners of the Township of Hopkins, Allegan County, Michigan and any other interested persons.

PLEASE TAKE NOTICE that the Hopkins Township Board of Trustees will hold a remote special meeting on Wednesday, July 29, 2020 at 7:30 p.m. via electronic teleconference due to concerns of COVID-19 and in compliance with the Governor's Executive Orders. The public may participate in this special board meeting by calling **1-978-990-5000** and entering ID No. **344706#.** You can also view the meeting at the following link: **https://join.freeconferencecall.com/hopkinstownshipconference**

The purpose(s) of the Special Board Meeting is to consider the following agenda item:

1. **The Proposed Hopkins Township Downtown Development Ordinance**

Members of the public will only be able to speak during the public comment portion of this Special Board Meeting and such comments will be limited to three minutes per person. To provide for orderly public participation, a person wishing to speak must state their name and request to be recognized by the Township Supervisor. The Supervisor will recognize all persons wishing to speak during the public comment. The Township recommends that all interested parties call-in to the meeting room by 7:20 p.m. so the Township may ensure all interested parties who want to attend are in the remote meeting room before the special meeting begins. The special board meeting will not start until 7:30 p.m.

PLEASE TAKE FURTHER NOTICE a copy of the meeting material may be found on the link on the Township's homepage at http://www.hopkinstownship.org/. Anyone interested in reviewing the Ordinance or documents regarding Hopkins Township DDA prior to the Special Board Meeting may request to examine a copy of these documents by contacting Eric Alberda, Township Clerk, by telephone at 269-806-7547, by email to clerk@hopkinstownship.org, or by mail at PO Box 217, Hopkins, MI 49328.

PLEASE TAKE FURTHER NOTICE THAT if members of the public have certain questions or wish to provide input on any business that will be addressed at the Special Board Meeting, then such persons may contact the Township Board Member through Eric Alberda, Township Clerk, by email to supervisor@hopkinstownship.org or clerk@hopkinstownship.org, by telephone at 269-806-7547, or by mail at PO Box 217, Hopkins, MI 49328.

PLEASE TAKE NOTICE that the Township Board may take action on the proposed Hopkins Township Downtown Development Ordinance. All persons are invited to participate in discussion on the above.

PLEASE TAKE FURTHER NOTICE that Hopkins Township will provide necessary, reasonable auxiliary aids and services at the hearing to individuals with disabilities upon 72-hour notice to the Hopkins Township Clerk of the need for the same. Individuals with disabilities requiring auxiliary aids or services should contact the Township Clerk by writing or by calling the Clerk at 269-806-7547 or clerk@hopkinstownship.org.

Hopkins Township Proposed DDA Revenue at 2% CPI only

Could be more deppending on how many parcels come uncaped

2019 TV	**TV 2020**	**TV 2021**	**TV 2022**	**TV 2023**	**TV 2024**	**TV 2025**
		2%	2%	2%	2%	2%
$ 5,983,198.00	$ 6,054,115.00	$ 6,175,197.00	$ 6,298,701.00	$ 6,424,675.00	$ 6,553,168.00	$ 6,684,231.00
		$ 6,054,115.00	$ 6,054,115.00	$ 6,054,115.00	$ 6,054,115.00	6,054,115.00
	TV Captured	$ 121,082.00	$ 244,586.00	$ 370,560.00	$ 499,053.00	$ 630,116.00
		$ 121.08	$ 244.59	$ 370.560	$ 499.053	$ 630.116
	42.3303 Mills	42.3303	$ 42.3303	$ 42.3303	$ 42.3303	42.3303
	DDATotal	$ 5,125	$ 10,353	$ 15,686	$ 21,125	$ 26,673

WATER AND WASTEWATER FEASIBILITY STUDY

WAYLAND TOWNSHIP
AND
HOPKINS TOWNSHIP
ALLEGAN COUNTY, MICHIGAN

U.S. 131 Corridor, East Lake, Herlan Lake, Ingerson Lake, Geenva Lake, and Selkirk Lake Wastewater Collection and Treatment
and
Water System Feasibility Study

September 2002
No. 14051 and 14052

FLEIS & VANDENBRINK
ENGINEERING, INC.
4771 - 50th Street SE, Grand Rapids, MI 49512
Ph. 616/541-6000 Fax 616/541-6010

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I. INTRODUCTION AND PURPOSE

Representatives of Wayland Township and Hopkins Township have recognized the desire for public sewer and water supply systems to serve portions of the Township. Development of public sewer and water supply systems is critical to the long-term growth needs of the Township and provides viable means for potential economic development of future business and industry. In addition, a public sewer system protects the lake environment while a public water system provides consistent water and also improves fire protection.

The purpose of this Water and Wastewater Feasibility Study is to identify sewer and water system master plans and service area capable of meeting the requirements for water supply, storage, and distribution and for wastewater collection and treatment. The study also estimates costs for the recommended improvements and examines potential funding alternatives. In conclusion, the study identifies a sewer and water system capital improvement plan that is capable of servicing Township residences, businesses, and potential development needs as they relate to present and future requirements within the identified service area. Areas of the Townships included as part of the study include (see Figure 1):

- 12th Street and US-131 Corridor in Hopkins Township, from 136th Avenue south to 124th Avenue. The width of the service area varies as indicated in Figure 1.
- East Lake area in Hopkins Township.
- Herlan Lake and Ingerson Lake areas in Hopkins Township.
- Geneva Lake and Selkirk Lake areas in Wayland Township.
- 129th Avenue from 131 east to 6th Street (Bradley Area) and 124th Avenue from 7th Street east to Patterson Road in Wayland Township (the area from 7th Street east to Patterson would likely only be served if the chosen wastewater treatment option is the existing Gun Lake system.

The US-131 Corridor is located in Sections 1, 12, 13 and 24 of Hopkins Township, just south of the Village of Wayland in Allegan County, Michigan. East Lake is located in Section 18 of Hopkins Township, north of the Village of Hopkins while Herlan Lake and Ingerson Lake are located in Section 32 of Hopkins Township, south of the Village of Hopkins. Geneva Lake and Selkirk Lake are located in Sections 29 and 32 of Wayland Township, south and east of the Village of Bradley. The Village of Bradley is the proposed location of a casino. The casino developers intend to provide an independent water and sewer system, but have indicated a willingness to work with the Township in establishing a Township system. The study area includes the areas described above with existing or potential future development as shown in Figure 1.

This report includes the review of alternatives to the existing on-lot method of sewage treatment and a review of alternatives to individual private water wells for domestic water. The alternatives are evaluated based on practicality and economic feasibility with related recommendations.

II. EXISTING CONDITIONS

Existing conditions are based on previous studies completed and reviewed as part of this study, information from public officials including Township representatives, Allegan County Health Department, and others.

Information requested from Allegan County Health Department and Allegan County GIS department indicate areas along the US 131 corridor are inadequate for on-site sewage disposal. The County Health Department indicates a moratorium has been issued for new systems within this portion of the study area.

Selkirk and Geneva Lake completed a study within the last couple of years. Our review of this study finds no significant changes from the assumptions made then. With respect to the lake's areas of the study area, the following general assumptions typically apply:

1. The systems are undersized. When some of the houses were built, the septic system design was based on the house being used as a cottage rather than a full time residence, which most of the homes have become. Under-sizing is also due to small lot sizes. Most wells are on the roadside of the house, forcing drain fields to be located in a floodplain area between the house and the lake. For this same reason even a mound septic system could not be adequately sized for many homes.

2. High water table and poor soil conditions. The ground water table is typically high around lakes making the separation between the drain field and water table minimal. A review of soils based on the County soil survey indicates portions of the study area have heavy soil conditions that reduces the ability of the effluent to discharge into the ground. Soil conditions are illustrated in Figure 2.

3. Tank Condition. The age and type of construction of the tanks decrease their ability to operate properly.

A majority of the existing septic tank systems were constructed prior to the establishment of Health Department permit requirements and regulations concerning size, isolation distances, ground water separation distances, and soil percolation requirements for on-site systems. As a result, a large number of the existing systems do not comply with current standards.

The Herlan and East Lake areas as well as the US-131 and 12th Street corridor have similar soil and ground water characteristics and a lower developed density.

Key items included in current Allegan County standards regarding the use of septic tank and drain fields are:

1. Drain fields or dry wells must be located a minimum of two feet above the high ground water level. This standard is considered lenient compared to most Michigan Counties. The State of Michigan recommends a minimum of four feet and approximately two-thirds of Michigan Counties require three feet or more. This is significant around Crockery Lake since many of the wells are shallow.

2. Drain fields or dry wells must be a minimum of 50 feet from lakes or streams and 50 feet from domestic water wells.

3. Minimum septic tank liquid capacity of 1,000 gallons, with greater capacities required for homes with 3 or more bedrooms.

4. Minimum absorption field trench area of 400 square feet with greater areas required for soils with low percolation rates or larger homes.

The County now requires an investigation of existing wastewater systems during the sale/purchase of any property. Due to small lot sizes, shallow ground water depths and poor soil drainage characteristics, many of the existing septic tank systems cannot be upgraded to meet current standards. Those that can be upgraded to meet standards do not have space to upgrade, they need mound systems with pumps or deep excavations.

There are a variety of septic tanks currently being used within the study area at this time. The newer systems have precast concrete tanks, but many of the units are older concrete block and brick tanks.

Fleis & VandenBrink Engineering, Inc. has been in contact with the Allegan County Health Department and requested copies of septic and water well report records for the initial and proposed service area.

CONCLUSIONS

Due to the moratorium for on-site sewage disposal along the US 131 corridor, alternate methods of treatment must be provided for the anticipated development in this area. In addition, other areas of the service area have been identified as poor for on-site sewage disposal, as shown from the soils map (Figure 2), the floodplain map (Figure 5) and the hydric soils/wetlands map (Figure 6).

In addition, generally, the data indicates that the area around the lakes and the Bradley area are not suitable long-term for on-lot septic systems. Continuing this type of treatment will ultimately adversely affect the water quality of the lakes in the Townships.

III. WASTEWATER FLOWS AND LOADINGS

The initial service area considered for this study includes the area along the US-131 Corridor from 136th Avenue south to 124th Avenue and 129th from US-131 east to 6th Street (including the Bradley area), as shown on Figure 1. Figure 1 also shows the future service area consisting of the area along the US-131 Corridor from 136th Avenue south to 124th Avenue and the lake front properties immediately surrounding East Lake, Herlan Lake, Ingerson Lake, Geneva Lake and Selkirk Lake, which is the area immediately adjacent to the initial service area and includes areas most likely to see future development. The number of homes and lots to be served is based on site visits and on the Parcels and Parcel Numbers map provided by Allegan County GIS Department (See Figure 3).

The wastewater flows are estimated based on the number of single-family homes currently occupied around Geneva Lake and Selkirk Lake, assuming 3.3 persons per home to estimate the Population Equivalents (P.E.). The 20-year projected flow rates include a 5% population growth per year for the first five years, then a 4% population growth per year for the last fifteen years of the 20-year study period. The projected flow rates also include the addition of service area to include East Lake, Herlan Lake and Ingerson Lake, industrial/commercial development of 350 acres in the US-131 corridor with an average of 1,500 gallons per acre per day (or 525,000 gallons per day). The 5-year (or 2007) projected flow rates include 5% population growth per year and assuming 20% of the industrial/commercial development occurs in 5 years or 105,000 gallons per day. The proposed casino is comprised of the casino, casino restaurants and resort/hotel.

Table 1 summarizes the service area assumptions including the number of homes, flow rates per home (assuming 100 gallons per person per day) and total flow rates for the existing, 5-year and 20-year design periods with and without the casino wastewater flows.

TABLE 1
SERVICE AREA POPULATION AND FLOWS

	Number of Residential Equivalents (R.E.)	Population Equivalent (P.E.) (3.3*R.E.)	Flow rate per Population Equivalent	Total Flow Rate
Current Average Daily Flows	120	396	100 gpd[1]	39,600 gpd[1]
2007 Average Daily Flows[3]	471	1,554	100 gpd	155,400 gpd
2007 Average Daily Flow with casino[5]	835	2,756	100 gpd	275,600 gpd
2022 Average Daily Flows[6]	1,954	6,448	100 gpd	644,800 gpd
2022 Average Daily Flow with casino	2,318	7,650	100 gpd	765,000 gpd

1. gpd - gallons per day
2. 2007 Average Daily Flow includes 5% population growth per year and 20% of the projected 2022 industrial and commercial flows of 525,000 gallons per day (0.2 x 525,000 god = 105,000 gpd).
3. Peak hour flow is based on a peaking factor of 2.9 times the average daily flow.
4. It is assumed that the casino will be fully developed by 2007. The casino, restaurants and hotel/resort is estimated to add 364 Residential Equivalents (REUs) or 120,000 gpd.
5. 2022 Average Daily Flow includes 4% population growth per year from 2007 through 2022, this includes adding service to East Lake, Herlan Lake and Ingerson Lake areas, 350 acres along the 131 corridor is developed into industrial/commercial use (assuming 1,500 gallons per acre per day), and the fully developed casino and spin-off commercial development of the casino, and spin-off commercial development as a result of the casino.

Table 2 presents the contribution of estimated wastewater flows from the sectors identified. Domestic wastewater flow consists of residential flow, the casino includes the casino development of restaurants, casino and hotel/resort, and the industrial/commercial consists of industrial development, restaurants, hotels and stores.

TABLE 2
CONTRIBUTION OF WASTEWATER FLOWS (AVERAGE)

	2007	**2022**
Domestic (i.e. residential)	50,600 gpd	120,000 gpd
Casino	120,000 gpd	120,000 gpd
Industrial/Commercial	105,000 gpd	525,000 gpd
TOTAL	**275,600 gpd**	**765,000 gpd**

Besides flow, the wastewater strength/characteristic and level of treatment are other variables that require assumptions to calculate feasibility of wastewater treatment. The following is a discussion of some of the parameters of concern for the level of treatment required.

BOD_5 represents the 5-day biochemical oxygen demand, which is a measure of the organic strength of the wastewater. BOD_5 represents the oxygen that would be used by microorganisms in the oxidation of the organic matter. BOD_5 is one parameter used in the design and sizing of wastewater systems (e.g., facultative lagoons or aerated basins). Surface water discharge treatment facilities monitor BOD_5 in the treated effluent because it represents a source of oxygen depletion in surface waters.

The nutrients are also a concern, in particular nitrogen and phosphorus. Nutrient control within the treatment system is critical to the success of the system being able to consistently meet discharge permit limits. Excessive nitrogen and phosphorus can cause excessive weed and algae growth in the receiving waters. Nitrogen can also degrade groundwater if inadequately treated wastewater is allowed to build up nitrates in the groundwater discharges.

Suspended solids provide an indication of the strength of the influent raw wastewater to be treated and the solids generation (during the settling/clarification process) anticipated. Suspended solids can lead to the development of sludge deposits and anaerobic conditions when untreated wastewater is discharged in the aquatic environments

In the following Tables 3a, 3b and 3c, BOD_5, Suspended Solids, Nitrogen and Phosphorus loadings are broken down by each sector; domestic, industrial/commercial and casino. The loadings for domestic are calculated by taking the population equivalent times the application

rates. The loadings for both the casino and the industrial/commercial sectors is determined by multiplying the flow by the application rate.

Wastewater Loadings are presented in Table 3a through 3c and 4:

TABLE 3a
WASTEWATER LOADING AND FLOWS FOR DOMESTIC

	Application Rates	Initial Service Area	2007	2022
Population Equivalents (P.E.)		396	506	1,200
Flow (gallons per day)	100 gpd/P.E.	39,600	50,600	120,000
BOD_5 (pounds per day)	0.22 [1] lb/day/P.E.	87	111	264
Suspended Solids (pounds per day)	0.25 [1] lb/day/P.E.	99	127	300
Nitrogen (pounds per day)	0.033 [2] lb/day/P.E.	13	17	40
Phosphorus (pounds per day)	0.004 [2] lb/day/P.E.	1.6	2	5

1. BOD_5 and Suspended solids Application rates came from GLUMRB (Great Lakes Upper Mississippi River Board) Recommended Standards for Wastewater Facilities.
2. Wastewater Engineering Treatment, Disposal, Reuse by Metcalf and Eddy was used to determine application rates for industrial/commercial. (assumed a medium untreated domestic wastewater for loadings determination).

TABLE 3b
WASTEWATER LOADING AND FLOW FOR INDUSTRIAL/COMMERICAL

	Application Rates[1]	Initial Service Area	2007	2022
Flow (gallons per day)		0	105,000	525,000
BOD_5 (pounds per day)	400 mg/l	0	350	1751
Suspended Solids (pounds per day)	350 mg/l	0	306	1533
Nitrogen (pounds per day)	85 mg/l	0	74	372
Phosphorus (pounds per day)	15 mg/l	0	13	66

1. Wastewater Engineering Treatment, Disposal, Reuse by Metcalf and Eddy was used to determine application rates for industrial/commercial. (assumed a strong untreated domestic for loading determination).

TABLE 3c
WASTEWATER LOADING AND FLOW FOR CASINO

	Application Rates[1]	**Existing**	**2007**	**2022**
Flow (gallons per day)			120,000	120,000
BOD_5 (pounds per day)	310 mg/l	0	310	310
Suspended Solids (pounds per day)	285 mg/l	0	285	285
Nitrogen (pounds per day)	60 mg/l	0	60	60
Phosphorus (pounds per day)	12 mg/l	0	12	12

1. Wastewater Engineering Treatment, Disposal, Reuse by Metcalf and Eddy was used to determine application rates for Casino. (assumed an average between medium and strong untreated domestic wastewater to estimate loadings from the fully developed casino).

TABLE 4
WASTEWATER LOADING AND FLOW (TOTAL)

	Flow (gallons per day)	BOD_5 (pounds per day)	Suspended Solids (pounds per day)	Nitrogen (pounds per day)	Phosphorus (pounds per day)
2007 Domestic	50,600	111	127	17	2
2007 Industrial/Commercial	105,000	350	306	74	13
2007 Casino	120,000	310	285	60	12
2007 Total	**275,600**	**771**	**718**	**151**	**27**
2022 Domestic	120,000	264	300	40	5
2022 Industrial/Commercial	525,000	1751	1533	372	66
2022 Casino	120,000	310	285	60	12
2022 Total	**765,000**	**2,325**	**2,118**	**472**	**83**

IV. WASTEWATER COLLECTION ALTERNATIVES

This feasibility study will review alternatives for Wastewater Collection that include both gravity and pressure systems. In general, two (2) modifications of each of these two types of wastewater collection systems were evaluated for this project and are listed below:

Gravity Systems:	CONVENTIONAL GRAVITY SMALL DIAMETER GRAVITY
Pressure Systems:	GRINDER PUMP SYSTEM SEPTIC TANK EFFLUENT PUMP (STEP)

Gravity Sewer Systems:

1. Conventional Gravity: Conventional gravity sewer systems utilize 8 inch and larger diameter pipe to carry wastewater. They are installed at a minimum slope to keep the sewage moving downhill. Manholes are provided at periodic intervals for access, cleaning and inspection. As these sloped sewer lines get deeper into the ground, lift stations are required to pump the wastewater up to sewers that are not as deep.

   For the proposed service area, conventional gravity sewers could serve most of the US-131 Corridor and 129th Avenue and 124th Avenue in Wayland Township. Due to topography around the Lakes areas (see Figure 4 and Figure 7), a pressure system may be required for these areas. There are some buildings that are considerably lower than the roadway. These buildings may require individual pumps to lift the wastewater up to the sewer elevation. There are also homes with first floor elevations similar to the road and walk-out basements at a lower level near of the lake. In these instances, the sewer could be placed in the road and only the first floor and above served by gravity. The homeowner would be responsible for providing a small lift pump if they desire basement sewer service. Many of these homes already have basement pumps to pump to their septic tanks.

   The gravity sewer system would require lift stations for the collection portion of the system. Each station consists of 2 underground chambers. An electrical panel would be located above ground at each location. Total required easement area for each station would be approximately 30’ x 50’.

   A layout of a conventional gravity system to serve the immediate service area is shown in Figure 8. The predesign cost estimates for the service areas vary depending on the location of the wastewater treatment facility. Table 8e summarizes the treatment costs for each of the areas and treatment options.

2. Small Diameter Gravity: Small diameter gravity sewer is an alternative to conventional gravity systems for instances when gravity sewers are expensive due to terrain or other construction restraints. The system utilizes septic tanks at each building to separate out the solids from the wastewater. The effluent or gray water from the septic tanks then travels by gravity into the sewer collection lines. These lines are usually only 2” to 6” in diameter and require less slope than conventional gravity lines due to the lack of solids. Manholes are not

necessary and are replaced with slightly less expensive cleanouts. Individual pumps are required at low homes just as with conventional gravity sewer. Lift stations are also required periodically as with conventional gravity.

Septic tank pumping would be required once every 2 to 4 years and the sludge would have to be disposed of per State and County regulations. Septic tank pumping would be completed as part of the system maintenance.

For Hopkins and Wayland Townships, the system layout would be similar to the conventional gravity system except with septic tanks at each building and smaller diameter and shallower collection sewer lines. It is estimated that 85% of the existing septic tanks would need to be replaced with water tight tanks. This is important especially in areas of high groundwater since groundwater infiltration into the small diameter lines would greatly reduce the capacity of the system. Septic tank location would be difficult due to the small lot sizes. Variances would be required on many lots for isolation to houses, lot lines, the lake and wells. Due to these issues, the cost of a small diameter gravity system would be equal to or greater than a pressure sewer system described below.

Pressure Sewer Systems:

Pressure sewers is another alternative to conventional gravity sewers. In areas of hilly terrain or around lakes where the homes are much lower than the road, pressure sewers follow the contour of the road. Since they are placed only 5 to 6 feet deep, they are less expensive to install.

A pressure system utilizes a small, single pump unit at each building or larger dual pump units for 2 or more homes. These pumps force the sewage into and through the collector pressure lines in the street. The collector line sizes are normally 1-1/2 inches to 6 inches in diameter since the sewage is grinded or removed of solids and pumped through the lines. Manholes are not necessary although cleanouts are utilized throughout the system. There are generally two types of pressure systems as described below.

1. Grinder Systems. A grinder system utilizes grinder pumps with small sewer lines. We have assumed one grinder pump for each building, although it may be possible to cluster some buildings into a common pump if so desired. Combining buildings into a common unit can reduce costs but requires additional easement acquisition with separate power service provided by the municipality as opposed to power being provided by each building. It also can cause problems if one homeowner is disposing of improper items into the sewer and thereby causing mechanical problems. In this case all homeowners connected to the common pump would be affected by the pump outage and resulting repair or replacement costs.

   Advantages of the grinder system are the ease of installation of the smaller, shallower collection lines. All buildings would also be provided with basement service including the walkouts that have lower levels below the road elevation. The predesign cost estimates for the service areas with pressure sewers are summarized in Tables 8a-8d.

2. Septic Tank Effluent Pump (STEP) System. STEP systems are essentially the same as the grinder system except they utilize an on-lot septic tank and efficient pump instead of a grinder pump. The septic tank settles out the solids so the pump is not

required to grind the sewage. The efficient pumps are less costly since they only need to pump the septic tank effluent through the pressure lines. The septic tanks would require pumping every 2-4 years and the sludge would require disposal per State and County regulations.

For Hopkins and Wayland Townships, a STEP system layout would be relatively the same as the grinder system. Placing septic tanks would be difficult due to the small lot sizes. Although the pump and collection line cost would be less than for the grinder system, the overall collection system cost would be higher due to the necessity of placing new septic tanks at an estimated 85% of the properties. This alternative was not considered in further detail since the disadvantages clearly out-weigh the advantages of the other alternatives.

V. WASTEWATER TREATMENT ALTERNATIVES

Various wastewater treatment alternatives were considered for the service area. Alternatives considered include:

- Connection to the Wayland WWTP
- Connection to the Gun Lake Sewer and Water Authorities system
- Connection to the Hopkins WWTP
- Connection to the Plainwell WWTP (via Martin)
- Construction of a new WWTP for the service area.

The following paragraphs provide a brief description of each treatment alternative considered.

Connection to Wayland WWTP

A letter request for information was sent to the Wayland WWTP regarding the connection to the treatment system. Wayland indicated connection to the treatment plant would require either a change in the City's ordinance and a significant connection fee. For the proposed flows indicated, the Wayland WWTP would require expansion. The new customer would pay the cost of expansion. In summary, it was determined unlikely that connection to the Wayland WWTP could be accomplished.

Connection to Gun Lake Sewer & Water Authority

The Gun Lake Sewer and Water Authorities treatment plant is currently operating at half of it's design capacity. It includes a sewer authority comprising Wayland Township, Yankee Springs Township, Martin Township and Orangeville Township. Expanding service to portions of Hopkins Township would require acceptance by all four of the existing Townships. Service to the areas of the study area within Wayland Township would currently be allowed. Based on the 20 year projected flows, we estimate the existing plant would need to be expanded to accommodate this entire flow. Construction of a new plant would likely be more cost effective than providing expansion to an existing plant given the projected flows due to the combined cost of expansion and transmission to a remote plant.

Connection to Hopkins WWTP

Hopkins Township indicates that the WWTP does not have capacity to accept additional wastewater at this time. Expansion of the plant would be required to provide service to additional areas in the Township. Similar to the GLSWA option, we believe construction of a new plant would be more cost effective than expanding an existing plant, given the projected flows.

Connection to Dorr-Leighton WWTP

A letter requesting information was sent to the operator of the Dorr-Leighton plant. The letter was forwarded on to the Township's engineer. No response has been received as of the date of this report.

Connection to Plainwell WWTP (via Martin)

The City of Plainwell indicated that the Plainwell plant currently has capacity, but this excess capacity is dedicated for the plant's current service area. In order to connect to the Plainwell treatment plant, the City would require the entities wishing to connect to pay for expansion of the plant, thus reserving the plants existing capacity for the current users. In addition, conversations with the Village of Martin indicated that its existing forcemain would not have capacity to transmit the additional flows (due to the expansion of the Martin Speedway) from Hopkins and Wayland Township. In summary, it was determined unlikely that connection to the Plainwell WWTP could be economically accomplished.

CONSTRUCT A NEW TREATMENT PLANT:

Since it would be cost prohibitive to build a plant to serve the much greater 20 year flows, and there are many variables affecting the 20 year flows, each of the system options below were reviewed using the projected five-year flows from Table 6. In five years, it is assumed that the Casino would be fully operational (i.e., fully developed) and that 20% of the industrial/commercial development that is being projected for the 20-year development plan has occurred. This flow also includes the current domestic flow plus an addition 5% per year for population growth.

Natural Treatment Systems

Facultative Lagoons
Aerated Lagoons
Subsurface Infiltration (Community Septic System)

Mechanical Treatment Systems

Sequencing Batch Reactor (SBR)
Oxidation Ditch

Note: Each of the treatment system options summarized above include treated effluent storage to accommodate a seasonal discharge permit.

A general description of each of the treatment alternatives considered with project specifics and considerations is presented below:

Natural Treatment Systems

Treatment of wastewater in natural systems is achieved by natural physical, chemical and biological processes that occur in the ecosystem, mainly soil, water and plant. Natural systems are capable of removing almost all of the major and minor constituents of wastewater that are considered pollutants, for example suspended solids, organic matter, nitrogen, phosphorus, trace metals, organic compounds and microorganisms. Since using natural treatment systems use natural processes which take longer to achieve the effluent parameters, the land required by natural treatment systems are usually significantly greater than the land required for a mechanical treatment system. The aerated lagoon system is a modified natural treatment system that involves the use of some mechanical equipment.

1. Facultative Lagoon

Facultative wastewater treatment lagoons provide both storage and treatment of the wastewater. A facultative lagoon system provides the stabilization of wastes by a combination of aerobic, anaerobic, and facultative bacteria activity. Treated water could either be discharged to surface water or groundwater for final disposal. For further discussion on surface water and groundwater discharges, refer to the "Types of Discharge" section.

Typically this system is a controlled discharge type system, which is classified as a Class L (lagoons) Waste Stabilization Lagoon system by MDEQ. This type of system functions by storing wastewater with release or discharge of treated effluent on an approximate semi-annual basis. Treated wastewater, or effluent, is typically released during high flow conditions in the receiving stream (e.g., surface water discharge) in the spring and fall of each year. Detention time of 180 days is required to meet the systems storage needs. Treatment volume for this type of system occupies the space above the bottom two feet of the lagoons. The volume occupied by the bottom two feet is allocated for sludge storage. This system is designed for the lagoons to operate in parallel or series mode.

The design of the lagoon liner system is based on the requirement for dual or composite liner system for the construction of new lagoons. Due to the potential for a lower discharge limit on phosphorus, this treatment alternative also includes a chemical feed system to control phosphorus prior to discharge periods.

Residuals management practices will be typical of lagoon wastewater treatment system operations, where biosolids are digested in the bottom two feet of the cells. Biosolids will require removal periodically based on solids accumulation. Frequency of biosolids removal depends on influent wastewater loading characteristics and reduction in volatile suspended solids in the lagoons.

Based on typical trends in wastewater flow to the lagoons, the two primary lagoons should provide approximately 10 to 20 years of storage before cleaning and disposal is recommended. Reduction in volatile suspended solids content from approximately 75% to 45% can be expected with proper biosolids management. The residuals from the lagoons will have to be land applied as fertilizer on farmland or dewatered and properly disposed of in a landfill. To dispose of the residuals on farmland, the residuals must meet the State and Federal Regulations (Part 503) for stabilization, including volatile solids reduction and pathogen and vector attraction reduction. This will require testing the residuals at the time of removal.

Preliminary design basis information is summarized in Table 9. The wastewater flow rate is estimated to be 0.276 MGD in 2007, the five-year design, with a loading of approximately 771 pounds of BOD_5 per day. The lagoons would be sized to provide up to 180 days of storage to accommodate a seasonal discharge. The preliminary review of the facultative lagoon size indicates approximately 31 acres are required. We would recommend the

construction of three (3) lagoons or cells with the third cell providing polishing and a higher quality effluent (over a 2-lagoon system). The system would be designed to allow for future expansion as flows increase beyond the 5-year planning period.

Including isolation distances and area for system facilities, a total of 40 acres is estimated for this treatment alternative. The pre-design cost estimate for this alternative is $4,027,000. Annual OM & R costs are estimated at $80,000. Additional acreage and project costs ($550,000) would be required if a groundwater discharge is needed, refer to the "Types of Discharge" section for more detail.

Advantages of this method of treatment include: proven technology; and low labor and maintenance costs to operate the system. One disadvantage to this alternative includes the inability of the system to remove nitrogen in cold climates. This can be major concern if a groundwater discharge is required and can limit the discharge until early June if nitrogen limits are included in the discharge permit. The MDEQ provided a preliminary surface water discharge permit for wastewater stabilized lagoon effluent in response to a request submitted by the Gun Lake Gaming Facility. The preliminary discharge permit did not contain limits for any nitrogen compounds.

2. Aerated Lagoon

The main function of aerated lagoons is waste conversion. Additional (beyond natural oxygen sources such as wave action and photosynthesis) oxygen is usually supplied by means of surface aerators or diffused air units. As with other suspended-growth systems, the turbulence created by the aeration devices is used to maintain the contents of the lagoon in suspension. There are several factors that must be considered in designing aerated lagoons they are: Biological Oxygen Demand (BOD) removal, effluent characteristics, oxygen requirements, temperature effects, and energy requirements for mixing and solid separation.

One preliminary design would have the wastewater enter into the first of 2 aerated cells or lagoons each approximately 1.5 acres. The aeration requirements is estimated to be approximately 60 horsepower of aeration in the first cell and 10 horsepower of aeration in the second cell. Following the aerated lagoons, clarification or solids settling is required. This can be done in a non-aerated lagoon or a circular concrete clarifier tank. Chemical additional of coagulant and/or a flocculent can be added to aid in the solids settling. Effluent from the clarification step would flow to a storage-polishing pond. The storage pond would have the capacity to hold 180 days of flow (a total of 49.6 million gallons). From the storage – polishing pond the wastewater would be ready for final disposal, either a surface water or groundwater discharge.

The design of the lagoon liner system is based on the requirement for dual or composite liner system for the construction of new lagoons. Due to the potential for a lower discharge limit on phosphorus, this treatment alternative also includes a chemical feed system to control (i.e., precipitate) phosphorus prior to discharge periods.

Solids removal from the clarification process would be pumped to a sludge storage lagoon. The sludge/solids residuals from the sludge storage lagoons would either be land applied or disposed of in a landfill. To dispose of the residuals on farmland, the residuals must meet the State and Federal Regulations (Part 503) for stabilization.

The system would be designed to allow for future expansion as flows increase beyond the 5-year planning period.

Including isolation distances and area for system facilities, a total of 25 acres is estimated for this treatment alternative. The pre-design cost estimate for this alternative is $4,250,000. Annual OM & R costs are estimated at $125,000. Additional acreage and project costs ($550,000) would be required if a groundwater discharge is needed, refer to the "Types of Discharge" section for more detail.

Advantages of this method of treatment include a smaller footprint than the facultative lagoon system and provides for better nutrient control by removing and storing the settled solids in a separate storage lagoon. Nitrogen removal during cold weather months is a concern in this alternative as well. The aerated lagoon system also requires a higher level of labor and maintenance costs than the facultative lagoon system.

3. Sub-Surface Infiltration (Community Septic System)

Sub-surface infiltration is another term for a drainfield. Wastewater is required to be pretreated via individual septic tanks located at each home or by being pumped to a grit removal and primary solids settling tank(s). The septic tanks or primary settling tanks provide screening and remove settleable solids from the wastewater (primary treatment). Primary treatment effluent wastewater is then dosed to the drainfield in a controlled manner. A dosing station would be constructed at the drainfield to dose the various beds evenly and to alternate between beds. The wastewater is treated by insitu soil bacteria during infiltration at the drainfield. Stabilization of the wastewater occurs primarily by removal of organic, oxygen-demanding material and sorption of wastewater bacteria to the soil. Nitrates present in the wastewater are not reliably treated using this method.

Site and soil suitability is a major factor in locating a site. The same criteria applies as with individual drainfields. Well-drained soils are needed as well as a groundwater table that is a minimum of 4' below the surface.

The drainfield area required would be approximately 13 acres for good to well-draining soil is available. A reserve drainfield area equal to the design drainfield area is required to be set aside for future use. An MDEQ groundwater discharge permit would be required for subsurface infiltration. Discharge limits for phosphorous and nitrogen would likely be applied. For this reason, additional treatment may be necessary to meet the limits.

The system would be designed to allow for future expansion as flows increase beyond the 5-year planning period.

Including isolation distances and area for system facilities, a total of 35 acres is estimated for this treatment alternative. The pre-design cost estimate for this alternative is $4,345,000. OM & R costs are estimated at $110,000.

Advantages of this method of treatment include a relatively low labor and maintenance cost to operate. However, because drainfields have a finite life (ability of insitu soil treatment eventually becomes exhausted), replacement costs for a new drainfield are anticipated. Additional treatment requirements to meet discharge limits may restrict the use of this alternative.

Mechanical Treatment Systems.

Mechanical treatment of wastewater typically consists of an accelerated treatment with the use of a biological (activated-sludge) process. This technology does not depend on nature for treatment to occur. Mechanical treatment systems have smaller site size requirements than natural treatment systems. However one disadvantage to a mechanical treatment system is that the operation, maintenance and replacement costs are generally higher than in a natural treatment system.

For discussion, following are two (2) types of mechanical treatment systems that have proven cost-effective for the 0.276 mgd to 0.765 mgd flow rate identified in the 5-year to 20-year design.

4. Sequencing Batch Reactor (SBR)

The SBR is a mechanical form of treatment that incorporates activated sludge treatment in which aeration, sedimentation and decant are all performed in a single reactor. The system typically requires a post equalization tank and some type of disinfections such as an ultraviolet (U.V.) system. The SBR systems have proven to be successful where mechanical treatment of small wastewater flows (i.e., under 1.0 million gallons per day) is desired. An SBR system could discharge to either surface water or groundwater.

Effluent limitations for the SBR alternative are anticipated to be more stringent than the lagoon alternative based on the draft surface water discharge permit the Gun Lake Gaming Facility received from the MDEQ. Due to the potential for a lower discharge limit on phosphorus, this treatment alternative also includes a chemical feed system to control phosphorus prior to discharge.

Current MDEQ permitting requirements requires a minimum of 2 SBR units with an equalization basin and grit removal system at the head of the system. A sludge stabilization process (e.g., aerobic or anaerobic digestion) and a holding tank (required to hold 180 days of solids) are required prior to disposal or land application.

The system would be designed to allow for future expansion as flows increase beyond the 5-year planning period.

A minimum of 15 acres of land would be required to accommodate the 5 year anticipated flows, this would give the desired isolation and the ability to expand the SBR system to achieve the 20-year flow rates of 765,000 gpd, if needed. The pre-design cost estimate for this alternative is $5,300,000. Annual OM & R costs are estimated at $250,000. Additional acreage and project costs ($550,000) would be required if a groundwater discharge is needed, refer to the “Types of Discharge” section for more detail.

Some of the advantages of the SBR system are its reliability and ability of producing a high quality effluent. SBR’s require less land area than a natural treatment type system. SBR’s also adapt well to wide flow variations and are well suited for expansion. Some disadvantages are that mechanical systems have a finite design life and eventually components and parts will need to be replaced. Operation of an SBR requires a skilled operator(s) that will increase the annual operating costs. Operation typically takes more

attention to process controls and the electrical/instrumentation systems than other types of feasible, small, mechanical plant systems, including the oxidation ditch, which is presented in the next system description.

5. Oxidation Ditch

The oxidation ditch is another mechanical form of treatment that uses the activated sludge biological treatment process and is usually classified as a complete mix, long-term aeration system. The construction of two oxidation ditches operating in parallel is required with a grit removal system ahead of them. Sedimentation is handled in separate tanks. Additionally, a solids digester and holding tank (required to hold 180 days of solids) is included for solids storage prior to disposal or land application. An oxidation ditch system could discharge to either surface water or groundwater.

A polishing pond was included in the development of this alternative to ensure reliable dechlorination and control of solids. Due to the potential for a lower discharge limit on phosphorus, this treatment alternative also includes a chemical feed system to control phosphorus prior to discharge.

The system would be designed to allow for future expansion as flows increase beyond the 5-year planning period.

A minimum of 15 acres of land would be required to accommodate the 5 year anticipated flows, this would give the desired isolation and the ability to expand the oxidation ditch system to achieve the 20-year flow rates of 765,000 gpd, if needed. The pre-design cost estimate for this alternative is $5,301,000. Annual OM & R costs are estimated at $250,000. Additional acreage and project costs ($550,000) would be required if a groundwater discharge is needed, refer to the “Types of Discharge” section for more detail.

Some of the advantages of the oxidation ditch process are the abilities to produce a high quality effluent on a reliable basis and to handle variable flows well. Operator attention and skill is typically equal or less than other comparable mechanical treatment systems based upon ease of operation and maintenance. The oxidation ditch requires less land area than a natural treatment type system, but will require land slightly more land than an SBR system. The oxidation ditch process is well established with many successful installations in Michigan.

Types of Discharge

F&V submitted an effluent limits request to the MDEQ – Surface Water Quality Division in regards to discharging into Buskirk Creek, which is a tributary to the Rabbit River. A response from the MDEQ on March 8, 2002 stated that they received our effluent limits request and that the application is currently being reviewed. As of September 5, 2002 a response has not been received. Until we receive a response from MDEQ, we have assumed the same type of effluent limitations that were given to the Gun Lake Gaming Facility (GLGF) from their effluents limit request. Note, the GLGF request was for discharge of treated wastewater into the same Buskirk Creek.

Following is a description of both surface water discharge and groundwater discharge, along with their advantages and disadvantages.

1. Surface Water

   With a surface water discharge, the treated effluent from any wastewater treatment process will discharge into the Rabbit River (via the Buskirk Creek). The discharge limit parameters in the GLGF's draft permit for a controlled lagoon discharge included BOD_5, suspended solids and fecal coliform bacteria. Parameters in the secondary (mechanical) treatment discharge permit included carbonaceous BOD_5, suspended solids, total phosphorus, fecal coliform bacteria, total residual chlorine, dissolved oxygen and pH.

   The receiving stream directly affects the surface water discharge permit limits. A preliminary review of the Rabbit River indicates it is a second order stream rated as second quality.

   The Kalamazoo River watershed includes Albion to the east, Battle Creek, Kalamazoo/Portage to the south, and Allegan to the west. It discharges into Lake Michigan west of Allegan. The Kalamazoo River watershed is one of the few State watersheds that has a strict Total Mass Discharge Limit (TMDL) for phosphorus. We are anticipating that any new surface water discharges will require additional treatment and control of phosphorus below the typical 1.0 mg/L limit.

2. Groundwater

   Discharges to groundwater are regulated under Act 451 of the Public of 1994, Part 22) as amended in August 1999. Typical parameters monitored in a groundwater discharge permit include monitoring the treated effluent and groundwater surrounding the discharge location ammonia, nitrate and nitrite nitrogen compounds, sodium, chloride, phosphorus and pH.

   Two options for groundwater discharges include: applying the treated effluent to the surface of a filter bed and allowing the effluent to percolate into the soil; or spray irrigating the treated effluent on agricultural crops and again letting the effluent percolate into the soil. While a groundwater discharge requires the construction of an additional unit process, it allows for additional polishing of the treated effluent (specifically nitrogen and phosphorus) for nutrient control. In a watershed that has restrictive limits on nutrients, a groundwater discharge providing additional effluent polishing may be required.

   In the Cost Estimate section, we have provided pre-design cost estimate for both of these groundwater discharge options

Other Considerations

Other considerations, which are addressed and could provide a basis of comparison of the alternatives, including industrial wastewater treatment needs, residuals management and facility growth capacity/reliability. The following summarizes other considerations during the alternatives comparison.

1. **Residuals management needs.** Each alternative provides for solids handling. Facultative lagoons and aerated lagoons provide solids storage in the lagoons for approximately 10 years. Therefore, solids disposal would not be needed for

approximately 10 years. The other alternatives would require solids treatment and disposal on a semi-annual basis. The solids would either be stabilized and land applied to a farm field or dried and disposed of in a landfill.

2. **Industrial waste treatment needs.** No industrial facilities exist in the project area currently, however the 5 -year design flow estimates that industrial/commercial will make up 38% of the influent. Facultative lagoons, aerated lagoons and infiltration systems are not designed to handle significant discharge from industrial facilities. Sequencing Batch Reactor (SBR) and the oxidation ditch systems are capable of handling an industrial facility with some process additions depending on the source. A well-implemented Industrial Pretreatment Program would need to be in place for a wastewater treatment system that accepts wastewater from industrial facilities.

3. **Industrial Pretreatment Program (IPP).** The requirement for an IPP is based upon the presence on any of the following:

   - Any industrial user subject to categorical pretreatment standards; or

   - Any other industrial user that discharges POTW an average of 25,000 gallons or more per day of process wastewater (excluding sanitary, non-contact cooling and boiler blowdown wastewater): or

   - Any other industrial user that contributes a process waste stream which makes up 5% or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or

   - Any other industrial user that is otherwise designated by the WWTF superintendent as significant industrial user on the basis that the industrial user has a reasonable potential to adversely affect the operation of the POTW or to violate any pretreatment standard or requirements.

1. **Facility growth capacity/reliability.** Each of the alternatives would provide for growth over 20 years, the major difference between the alternatives is the amount of land required.

2. **Operation, Maintenance and Replacement Costs.** Annual operation cost would be the lowest for the facultative lagoon, due to the low maintenance and labor required. The aerated lagoon system and the infiltration system have a higher operation and maintenance cost due to labor and equipment costs for the solids handling operations. The infiltration system also includes a replacement cost for the drainfield. The SBR and oxidation ditch systems have the highest annual operational cost since skilled operators are required along with additional time necessary to operate the plant, solids disposal and equipment replacement costs.

COST ESTIMATES

The preliminary cost estimates are based on the 5-year design flow of 0.276 MGD, since the 20-year flow estimate includes too many variables to plan for and may never be reached. Following are preliminary cost estimates for each of the alternatives. A preliminary review of costs to

purchase local land indicates that to purchase less than 40 acres, the cost is approximately $10,000 per acre. To purchase 40 or more acres, the cost is approximately $5,000 per acre. Because of the cost discrepancy in the cost per acre depending on land purchase size (i.e., 20 acres would cost the same as 40 acres), the cost estimates below assume a land purchase of 40 acres for each of the treatment alternatives. The exception is the spray irrigation system, which requires more than 40 acres.

Facultative Lagoon

Construction		
Wastewater Treatment Facility		$2,650,000
Land Purchase (40 acres @ $5,000/acre)		$ 200,000
Engineering/Legal/Hydrogeological		$ 662,000
	Sub-Total	$3,512,000
Contingency 15% of subtotal		$ 497,000
Non-Construction		
Administration		$ 17,000
	TOTAL:	**$4,027,000**
Annual Operation and Maintenance		
OM&R		$ 80,000

Aerated Lagoon

Construction		
Wastewater Treatment Facility		$2,804,000
Land Purchase (40 acres @ $5,000/acre)		$ 200,000
Engineering/Legal/Hydrogeological		$ 701,000
	Sub-Total	$3,705,000
Contingency 15% of subtotal		$ 526,000
Non-Construction		
Administration		$ 19,000
	TOTAL:	**$4,250,000**
Annual Operation and Maintenance		
OM&R		$ 125,000

Subsurface Infiltration

Construction		
Wastewater Treatment Facility		$2,870,000
Land Purchase (40 acres @ $5,000/acre)		$ 200,000
Engineering/Legal/Hydrogeological		$ 718,000
	Sub-Total	$3,788,000

Contingency 15% of subtotal		$ 538,000
Non-Construction		
Administration		$ 19,000
	TOTAL:	**$4,345,000**
Annual Operation and Maintenance		
OM&R		$ 150,000

Mechanical Treatment Systems (SBR and Oxidation Ditches)

Construction		
Wastewater Treatment Facility		$3,467,000
Land Purchase (40 acres @ $5,000/acre)		$ 200,000
Engineering/Legal		$ 949,000
	Sub-Total	$4,616,000
Contingency 15% of subtotal		$ 662,000
Non-Construction		
Administration		$ 23,000
	TOTAL:	**$5,301,000**
Annual Operation and Maintenance		
OM&R		$ 250,000

Groundwater Discharge Options

Option 1: Rapid Infiltration Beds (RIBs)

Construction		
Construction of Beds		$ 255,000
Land Purchase (40 acres @ $5,000/acre)		$ 200,000
Engineering/Legal/Hydrogeological		$ 51,000
	Sub-Total	$ 506,000
Contingency 15% of subtotal		$ 38,000
Non-Construction		
Administration		$ 3,000
	TOTAL:	**$ 547,000**
Annual Operation and Maintenance		
OM&R		$ 40,000

Option 2: Spray Irrigation Fields

Construction		
Construction of Spray Irrigation System		$ 180,000
Land Purchase (60 acres @ $5,000/acre)		$ 300,000
Engineering/Legal/Hydrogeological		$ 36,000
	Sub-Total	$ 516,000
Contingency 15% of subtotal		$ 27,000
Non-Construction		
Administration		$ 3,000
	TOTAL:	**$ 546,000**

Annual Operation and Maintenance

OM&R	$ 65,000

VI. COST ESTIMATES

Construction costs for the sanitary sewer collection system alternatives are presented in the attached tables. Tables 8a through 8d itemize proposed sanitary sewer collection systems for gravity sewer and grinder pumps and show the estimated cost for each of the systems. Table 9 summarizes the various collection system costs as they relate to the treatment alternatives and shows their present worth.

Tables 11 summarizes proposed wastewater treatment options.

VII. WATER SYSTEM REQUIREMENTS

A. WATER DEMAND

Water demand is defined as the volume of water consumed for domestic use over a given period of time. Throughout this report, demand will be expressed in terms of the flow rate in gallons per minute (gpm).

Each type of water customer in the system and their particular water needs must be considered when determining the demands to be placed on a new water system. For example, households, apartments and businesses each have their own unique demands for water. Houses typically use more water than apartments on a per capita basis due to a larger number of inhabitants and lawn sprinkling, while business water demand varies significantly with the type of business. In addition to each type of customer's demand varying, seasonal variations will also create a fluctuation in water demand. Each of these conditions have been noted and analyzed to estimate the water demand that will be placed on the Hopkins/Wayland Township water system.

From discussions with representatives of Hopkins and Wayland Township, the proposed water service area shown in Figure 1 includes potential industrial use along the US-131 corridor and the potential for future commercial users near Bradley. In addition, future service areas considered included Selkirk and Geneva Lake, Herlan Lake and Ingerson Lake

Part of the service area is currently developed and part is currently undeveloped. The first step taken to determine the water demand was estimating the number of homes that currently exist within the service area and estimating the total number of homes that would exist in a "built-out" or developed condition. To estimate the current number of homes in the service area, Township tax maps were reviewed and counts were taken during visits to the area. Statewide, the average number of people per home is estimated to be 3.3. This average was used to determine the service population. Additionally, an average of 100 gallons of water per person per day is used. The estimated current and future average day water demands are shown in Table 5.

TABLE 5
HOUSING, POPULATION, & AVERAGE WATER DEMAND

	Number of Residential Equivalents (R.E.)	Population Equivalent (P.E.) (3.3*R.E.)	Average Day Water Demand (gpm)
Current Condition	120	396	28
2007 Future Condition	471	1,554	108
2007 Future Condition (with Casino)	835	2,756	191
2022 Future Condition	1,954	6,448	448
2022 Future Condition (with Casino)	2,318	7,650	531

The average day water demand is the average flow of water out of the water system on a continuous basis throughout the year. Water system customers will use more water at peak times during the day and during the summer months and therefore, a peak day (or maximum day) demand must be calculated. To calculate the Max Day Demand, a multiplier or peaking factor is applied to the average day demand. This report considers a Max Day to Average Day Peaking factor of 3.0, which is typical of other communities. Table 6 below shows current and future Peak Day Demands.

TABLE 6
Peak Day Water Demands

	Average Day Water Demand (gpm)	**Max Day Water Demand (gpm)**
Current Condition	28	84
2007 Future Condition	108	324
2007 Future Condition (with casino)	191	573
2022 Future Condition	448	1,344
2022 Future Condition (with casino)	531	1,593

B. WATER SUPPLY

The Michigan Safe Drinking Water Act (ACT 399, PA 1976) requires municipal water systems to provide quality drinking water in a dependable and consistent fashion. This requirement has caused other communities similar to Hopkins and Wayland Township to establish groundwater systems as their source for water. These systems generally require little or no treatment, offer uniform water temperatures throughout the year, and are less expensive than impounding reservoirs. In addition, wells throughout the state often yield a consistent and high rate of flow.

Other sources of water that may be considered for a public system are nearby lakes and streams or extending water main from an existing system. However, the need to build a water filtration plant would make the first option cost-prohibitive based on service area size. Costs for extending water main from the nearest public system (Yankee Springs Township) were evaluated. This report will also consider groundwater wells as a feasible option for supplying water to residences in the Township. Another option, which has been discounted for now, is the proposed future County wide water filtration plant and distribution system being discussed. Conversations with the Engineer working on that study indicate that service to Hopkins and Wayland Township would be part of a later phase. The county-wide master plan would provide a water treatment plant in Laketon Township. If Hopkins/Wayland Township proceed with their own system, they could possibly connect into the County wide system at some point in the future.

Another aspect of the Michigan Safe Drinking Water Act requires that a municipal water system's firm capacity meet or exceed the maximum day demand plus fire flow. A water system's firm capacity is defined as the production capability of the waterworks system with the largest well, pump, or treatment unit out-of-service. Therefore, with a groundwater well system, the firm capacity of the system would be calculated with the largest producing well out-of-service.

With these requirements, two or more groundwater wells would be required to serve the Hopkins/Wayland Township system. The well's capacity, other than the largest well, would need to meet or exceed the future max day demand of 1,593 gallons per minute (calculated above). We recommend that the rated capacity of the two or more wells exceed the max day demand due to the difficulty in predicting future conditions and the minimal capital costs of increasing pump capacity. We recommend the new wells have a capacity of 1,600 gpm each for 2 wells or 800 gpm each for 3 wells, resulting in a system firm capacity of 1,600 gpm.

If connection was made to the Yankee Springs system to extend service to the service area in this report, a booster station would be required, at a minimum. An evaluation of the Yankee Springs system would have to be completed to determine if additional storage or an additional well would be required in the future. It is relatively safe to assume these items would be required, and they are included on the cost estimate attached.

C. WATER STORAGE

The purpose of water storage is to provide water during emergency periods (both wells out of service) and to provide fire protection. The water demands of a fire typically far outweighs the capacity of a water system's wells and pumps. Therefore, the volume of a storage tank must make up the difference. Water systems that do not have water storage typically only have very limited fire fighting capabilities. It is in Wayland and Hopkins Township's best interest to include a storage tank in their water system. Home insurance rates can be significantly reduced in a community with good fire fighting capabilities.

Several factors must be considered when attempting to provide adequate water storage for a small community. These factors include establishing the correct tank volume, height, and location with respect to the particular geographical limitations and population of the community. The topography of the proposed service area and availability of land further defines the height and location of the tank.

The Insurance Services Office (ISO) is a private company that rates municipal water systems for their ability to fight fires. Their ratings, in part, determine the costs of homeowners insurance throughout the subject community. The ISO also has guidelines on calculating the needed fire flow to combat a fire. The needed fire flow for any given building is based on many factors including the use of the building (residence, business, industry, etc.), the size of the building, and the type of building construction. A review of the ISO's guidelines indicate that the proposed service area for Hopkins and Wayland Township has a recommended fire flow of 3,000 gallons per minute for a duration of 3-hours. This recommended fire flow is based on providing service and fire projection to future businesses and industries within the service area.

With these ISO guidelines, the storage tank volume required is calculated as follows:

$$\text{Tank Capacity} = \left(\text{Fire Flow + Max Daily Demand – Firm Capacity}\right) \text{ x Duration}$$

$$= \left[\left(3{,}000\text{gpm} + 1{,}600\text{gpm}\right) - 1{,}600\text{gpm}\right] \text{ x } \left(3 \text{ hours x 60 minutes per hour}\right)$$

$$= \underline{\mathbf{540{,}000\ gallons}}.$$

The height of an elevated storage tank should be established based on the highest elevation of the potential service district and providing average static pressures of 55 to 75 pounds per square inch (psi) in the system. Further, it is desirable to position the tank in an area of the distribution system opposite the primary water supply or central to the system users to minimize pressure differences and increase system reliability. This way, under extreme flow conditions such as during a fire, a more consistent and dependable supply can be provided from either source.

The highest land in the vicinity of the Hopkins and Wayland Township water service area is located east of Bradley. Based on the criteria stated above, the most desirable location for a water storage tank would be in this area with the supply wells near 131 along 129th Avenue.

As an alternative to an elevated storage tank, it should be mentioned that the Township's may wish to consider a Hydro-pneumatic storage tank. Although this type of storage facility offers significant cost savings, it cannot deliver adequate fire protection to the community as recommended by the ISO and homeowner's insurance rates would reflect this. However, communities similar to Hopkins and Wayland Township have started new water supply systems with Hydro-pneumatic tanks with plans to upgrade their storage facilities at a later date. This two step approach provides a cost-effective means of establishing a distribution system and then providing fire protection when the community can afford to.

D. WATER DISTRIBUTION

The water distribution system recommended for the communities of Hopkins and Wayland Township would consist primarily of ductile iron watermains. Fire hydrants would typically be placed at approximately 400-foot intervals along the watermain. Isolation valves are typically provided at watermain intersections and/or approximately every 1,000 feet along transmission mains in rural areas. Valves are generally located to help isolate a smaller section of the system in the event of a watermain break or to facilitate general maintenance.

The diameter of a watermain is primarily based on flow and pressure requirements needed to reach the extremities of a network together with the required capacity to transport fire flow. The State of Michigan requires that all new watermain not be any smaller that 6" in diameter for general use. The recommended minimum size to provide adequate fire flow is 8" diameter pipe and systems distributing high volumes of water over long distances should not be less than 12" in diameter. In general, an efficient and low maintenance distribution network will include free flowing loops that connect back onto itself and minimize long "dead-ends". Figure 9 shows locations of recommended 8" and 12" watermains throughout the initial service area.

E. OPERATION AND MAINTENANCE

After the new water system has been installed and is ready to be placed into service, it will require the ongoing supervision of a licensed operations technician. The Michigan Safe Drinking Water Act has set forth three basic licensing classifications an operator must achieve prior to managing a system; F-1 through F-4, D-1 through D-4, and S-1 through S-4. In particular, an operator overseeing a system requiring full water treatment will need an F license, operators supervising systems with "limited" treatment facilities will need a D license, and operators functioning simple distribution systems with no treatment facilities will need an S license. The population of the community and the capacity of the water system determine an operator's required numerical sub-category.

The water system proposed above requires at least an S-4 water distribution license and a D-4 water treatment license. Unless extensive water treatment is required, an F license would most likely not be required. The State recommends that at least two people become licensed operators for a community system. This is a simple safe guard to help ensure the system is operated reliably and allow at least one person to be available at all times.

In addition to general operational duties, the operator must be prepared for maintenance of the distribution system. All municipal systems require the attention of regular and systematic maintenance of hydrants, valves and (in growing communities) the installation of service leads. Considerable attention must also be given to the operator's ability to respond to emergency repair situations. Both general and emergency maintenance activities will require the purchase and storage of materials such as watermain pipe, valves, fittings, meters and specialized tools.

Alternatively, the operator could function in the capacity of a maintenance manager and outsource all required repair work including emergencies to a local contractor. Even though certain materials may still need to be inventoried by the owner of the water system, a considerable cost savings could be realized. Emergency situations would require establishing a relationship with two or more contractors to ensure prompt attention is given to getting customers back in service.

F. COSTS

Table 12 presents the costs to extend water from the Yankee Springs water system to serve the immediate service area. Table 13 presents the cost of a new water system to serve the immediate area and additional costs to extend to the future service areas. Table 14 summarizes the water system costs for the two alternatives.

VIII. SUMMARY OF RECOMMENDED IMPROVEMENTS

It is recommended a new water system be installed jointly between Hopkins and Wayland Township, to serve proposed development in and around Bradley and the US-131 corridor from 136th Avenue to 124th Avenue.

Improvements recommended in this study have been categorized below into four areas of focus.

1. WATER SUPPLY

- Construct two (2) groundwater wells with 1,600 gpm capacity, located near US-131 and 129th Avenue. This work would include the new wells with submersible pumps and underground piping to a new well house and emergency generator (does not include land acquisition costs). If 1600 gpm cannot be achieved in a single well, we recommend 3-800 gpm wells, which would be more costly.

Estimated project cost: $690,000

2. WATER STORAGE

Construct an elevated water storage tank with a volume of 550,000 gallons and associated watermain to connect to the watermain distribution network. It is estimated one acre of land with access right-of-way or easement will be required to construct and maintain the proposed water storage tank. (Includes $50,000 land acquisition cost). If the amount of future development is still relatively uncertain at the time of construction, the Township could consider a smaller tank and adding a second tank when development occurs.

Estimated project cost: $1,510,000

3. WATER DISTRIBUTION

Construct a watermain distribution network in the locations as detailed in Table 3. Estimated project costs are based on $65 per linear foot water main.

Estimated project cost: $4,350,000

4. ANNUAL OPERATION

Annual operation and maintenance cost including repairs, administration, billing, meter reading, etc.

Estimated annual cost: $25,000

TOTAL CAPITAL COSTS $6,550,000

TOTAL ANNUAL COSTS $50,000

IX. FINANCING

The following paragraphs discuss potential financing options for the Wayland and Hopkins Township wastewater collection and treatment system and water system. It is likely that a combination of special assessments and monthly service charges would pay for the costs to build the project.

Besides conventional financing, there are other programs available to the Township: The State Revolving Loan Program, Drinking Water Revolving Fund, the Michigan Municipal Bond Fund and Rural Development grants or loans. It is possible that one or more of these sources could be used to fund a portion of the project. It is recommended that the Township's evaluate each of these alternatives based on the service area selected for each utility.

It should be noted, that some outside sources of funding will inherently increase the project cost due to administration, audits, potential additional system requirements and minimum construction wage rates. However, the overall affect of such funding will most likely reduce the cost to the users.

USER FEES AND ASSESSMENTS

User fees are an excellent source of steady income over the life of a water system. In addition, connection fees and assessments are tools used to generate larger sums of income is over a limited period of time. These sources of income can be used in combination with other revenues to help defray the cost of construction loans and annual operation costs.

Following is a review of how portions of this project might be funded by associated users in the community.

Special Assessments

In general, all of the properties in the project area that are served by new utilities can be specially assessed. Special assessments are typically based on the total costs for the material and construction of just the collection distribution systems alone, which includes piping, hydrants, valves, manholes, etc. In particular, the amount of an assessment maybe determined by dividing these specific costs by the total number of users that can become connected to the system and then multiplying that amount by the appropriate REU. Each home that benefits from the proposed utility can be specially assessed in this manner.

Connection Fees

A Connection Fee is a fee assigned when a customer attaches to the system. This fee can be based on total costs the installation of water or sewer to serve the customer.

Monthly User Fees

Monthly user fees are an important source of continued income for the Townships to offset the expense of operation and maintenance of a water system. User fees are calculated to pay for employee's wages, materials, maintenance, treatment, and general administration costs.

Since most of these expenses cannot be fixed, user fees must be periodically adjusted to ensure there is an adequate balance for timely payment. Typically, every five years the municipality will reevaluate the cost of operations and maintenance and make the appropriate

adjustments to monthly user fees. An illustration of the importance to perform a regular assessment of operational costs would be as the number of users on the system increases, the Township's gain income through monthly user fees. However, the additional customers could also increase administration costs for billing, maintenance costs, and inventory costs. Typically, as the number of customers on a water system increases, the monthly user fees will decrease.

We have provided some examples of funding by assessment district based on serving the 131 corridor and 129th Avenue (including casino) with water and sewer. It assumes the water system will be a new system and wastewater treatment will be by a new mechanical plant with ground water discharge.

TABLE 7

ESTIMATED COSTS TO THE USERS OF THE SYSTEM

131 Corridor and 129th Avenue Wastewater Collection with Mechanical Treatment

Assessment and Connection Fees		$ 2,750.00
Trunkage Fee		$ 4,250.00
TOTAL		**$ 7,000.00**
On-lot Cost:	$10 to $20/foot sewer lead and $200 per septic tank/drywell abandonment approximately $500 to $2,000 per lot total, $1,200/lot average.	$ 1,200.00
Operation, Maintenance & Replacement Monthly User Fee/REU		$ 25.00
Monthly Debt Service Charge/REU		$ 21.00
TOTAL MONTHLY		**$ 46.00**

Notes: Assumes 6.5% interest on assessments and 5.5% interest on bonds over 20 years.

The above assessments and connection fees can be paid in cash or over a 20-year period with interest. When the assessments and connection fees are paid over time, 1/20 of the principal and interest on the outstanding balance is due each year.

The assessments and monthly user fees are based upon 2002 construction costs. Depending upon the year of construction, assessments and user fees should be adjusted accordingly.

ESTIMATED COSTS TO THE USERS OF THE SYSTEM

131 Corridor and 129th Avenue New Water System

Assessment and Connection Fees	$ 5,000.00
Capacity Fee	$ 1,000.00
TOTAL	**$ 6,000.00**
Operation, Maintenance & Replacement Monthly User Fee/REU	$ 5.00
Monthly Debt Service Charge/REU	$ 14.00
TOTAL MONTHLY	**$ 19.00**

Notes: Assumes 6.5% interest on assessments and 5.5% interest on bonds over 20 years.

The above assessments and connection fees can be paid in cash or over a 20 year period with interest. When the assessments and connection fees are paid over time, 1/20 of the principal and interest on the outstanding balance is due each year.

The assessments and monthly user fees are based upon 2002 construction costs. Depending upon the year of construction, assessments and user fees should be adjusted accordingly.

The appendix includes similar estimates for user costs for 3 other potential service areas. Table 15a serves Selkirk & Geneva Lake only with sewer (no casino); Table 15b services Selkirk & Geneva Lakes and Bradley area with sewer (with casino); and Table 15c serves 131 corridor only with water and sewer (no casino).

Potential Grant/Loan Programs:

State Revolving Fund (SRF):
The State of Michigan offers low-interest money as loans to communities under the State Revolving Fund (SRF) program for wastewater collection and treatment projects. To receive a low interest (approximately 2.5%) loan, the community must complete a Project Plan. The Project Plan report would provide a description of the problem, present and compare alternatives to solve the problem, select a preferred alternative to the problem, and review and evaluate impacts of the selected alternative with respect to environmental and community impacts. The Project Plan is submitted and the State ranks all projects based on the extent of the problem. Projects are funded based on this ranking until the money "runs out" for each year.

MI Bond Fund:
This fund is a source of financing for Michigan Communities at a low interest rate for water and wastewater projects.

Rural Utilities Service Grants or Loans (RUS, formerly FHA)
The Rural Utilities Service (RUS) provides grants and loans to lower income rural communities for infrastructure improvements including water and wastewater systems. There is typically as much as $40,000,000 each year to distribute. Funding assistance is typically arranged in a combination of a Grant and Loan. To qualify for a Rural Utilities Service Grant or Loan, the community must have a population of less than 10,000 people. A preference is given to those communities having less than 5,500 people.

Typically, an RUS grant and loan is awarded based on the need for the proposed improvements. Several factors are considered when determining the need, which include median household income, amount of available community funds, and a comparison of utility rates for similar communities. Communities with a median household income at the poverty level may be eligible for a 75% grant and 25% loan. While communities with a median household income of less than $32,449 may be eligible for a 45% grant and 55% loan. The interest rate on the loan portion is based on median household income. Current interest rates are between 3.25% and 4.375%. Hopkins Township median household income in 1989 was $30,511, while the 1990 poverty level was $25,959 (source: 1990 census data). Wayland Township had a 1989 median household income of $30,925. The 2000 census data will soon provide updated median income levels and RUS will also adjust their thresholds of funding.

Low interest loans may also be available. There are two types of loans available from RUS: direct loans and guaranteed loans. Direct loans are only issued if the Township is unable to obtain funding from other sources at reasonable rates. The current interest rate is between 4 and 5 percent. Guaranteed loans are made and serviced by commercial lenders such as banks and savings & loan institutions. Guarantees will not exceed 80 percent on any loss of interest and principal on the loan.

Community Development Block Grant (CDBG)
The CDBG program is administered by the Michigan Jobs Commission and distributes about $30,000,000 in grants to communities across Michigan each year. These grants are given for economic planning, rehabilitation, redevelopment, and infrastructure development. Three different types of CDBG grants are available, which are Economic Planning, Commercial and Industrial Rehabilitation/Redevelopment, and Economic Development of Infrastructure. In the case of developing a water system for Hart Township, an Economic Development Infrastructure Grant would be appropriate.

One of the major requirements of the grant is a commitment from a private company to add at least 10 full time jobs to the community for at least two years of employment. The private company would need to directly benefit from the proposed improvements. Core manufacturing companies are given a strong preference. The maximum grant available is $750,000 and a local match of 10% is also required.

Economic Development Administration Grants (EDA)
The US Economic Development Administration (EDA) gives grants and loans to communities for infrastructure improvements. Grants are provided to help distressed communities attract new industry, encourage business expansion, diversify local economies, and generate long-term, private sector jobs. The program is primarily intended to benefit communities with low and moderate-income populations. If industries were considering expanding or relocating to the Hart Township area as a result of the proposed infrastructure improvements, or an industry were going to expand in lieu of relocating, then this type of grant should be considered as a possible funding source.

Grant & Loan Summary
All of the above programs require submission of a project plan or engineering report with a detailed report outlining the scope of the proposed improvements together with a discussion regarding an assessment on any environmental issues including any impact the project may have on the community. The project plan can be prepared and submitted along with a grant application once a particular funding strategy is developed.

INSURANCE RATINGS

With the addition of an elevated storage tank in the new system, fire protection is afforded to each building served by water. This increased protection against loss by fire gives each homeowner the potential of reduced insurance rates.

To help determine a homeowner's insurance rate, the Insurance Service Office (ISO) will rate a community on a scale of 1 to 10 with 1 being the best protected and 10 the worst protected. Whenever fire protection in a community is increased, the ISO will typically adjust the rating to reflect the added margin of safety provided in the community. This in turn provides homeowners with the ability to seek lower costs for their insurance policy.

As an example, the Township may currently have an ISO rating of 9. With the proposed improvements in place, it is possible that the new ISO rating for the Community could drop to 7. In turn, an individual homeowner could realize a decrease in homeowners insurance premiums of $85 to $125 per year based on a home with a value of between $100,000 to $200,000.

Appendix A

Letters of Request and Response from Neighboring Communities

Appendix B

Figures

Appendix C

Cost Summary for Collection System and Water Distribution System

TABLE 15-A

ESTIMATED COSTS TO THE USERS OF THE SYSTEM

Selkirk and Geneva Lakes (without Casino) -Wastewater Collection with Aerated Lagoon Treatment

Assessment and Connection Fees		$ 7,000
Trunkage Fee		$ 3,000
	TOTAL	**$ 10,000**
On-lot Cost:	$10 to $20/foot sewer lead and $200 per septic tank/drywell abandonment approximately $500 to $2,000 per lot total, $1,200/lot average.	$ 1,200.00
Operation, Maintenance & Replacement Monthly User Fee/REU		$ 30
Monthly Debt Service Charge/REU		$ 69
	TOTAL MONTHLY	**$ 99**

Notes: Assumes wastewater treatment is new aerated lagoon treatment plant.

Assumes 6.5% interest on assessments and 5.5% interest on bonds over 20 years.

The above assessments and connection fees can be paid in cash or over a 20 year period with interest. When the assessments and connection fees are paid over time, 1/20 of the principal and interest on the outstanding balance is due each year.

The assessments and monthly user fees are based upon 2002 construction costs. Depending upon the year of construction, assessments and user fees should be adjusted accordingly.

TABLE 15-B

ESTIMATED COSTS TO THE USERS OF THE SYSTEM

Selkirk and Geneva Lakes and Bradley Area (with Casino) -Wastewater Collection with Mechanical Treatment

Assessment and Connection Fees		$ 3,000
Trunkage Fee		$ 2,000
	TOTAL	**$ 5,000**
On-lot Cost:	$10 to $20/foot sewer lead and $200 per septic tank/drywell abandonment approximately $500 to $2,000 per lot total, $1,200/lot average.	$ 1,200.00
Operation, Maintenance & Replacement Monthly User Fee/REU		$ 13
Monthly Debt Service Charge/REU		$ 20
	TOTAL MONTHLY	**$ 33**

Notes: Assumes wastewater treatment is new mechanical treatment plant.

Assumes 6.5% interest on assessments and 5.5% interest on bonds over 20 years.

The above assessments and connection fees can be paid in cash or over a 20 year period with interest. When the assessments and connection fees are paid over time, 1/20 of the principal and interest on the outstanding balance is due each year.

The assessments and monthly user fees are based upon 2002 construction costs. Depending upon the year of construction, assessments and user fees should be adjusted accordingly.

TABLE 15-C

ESTIMATED COSTS TO THE USERS OF THE SYSTEM

131 Corridor - Wastewater Collection with Mechanical Treatment to serve 2 year needs

Assessment and Connection Fees		$ 10,000
Trunkage Fee		$ 5,000
	TOTAL	**$ 15,000**
On-lot Cost:	$10 to $20/foot sewer lead and $200 per septic tank/drywell abandonment approximately $500 to $2,000 per lot total, $1,200/lot average.	$ 1,200
Operation, Maintenance & Replacement Monthly User Fee/REU		$ 140
Monthly Debt Service Charge/REU		$ 102
	TOTAL MONTHLY	**$ 242**

Notes: Assumes 6.5% interest on assessments and 5.5% interest on bonds over 20 years.

The above assessments and connection fees can be paid in cash or over a 20 year period with interest. When the assessments and connection fees are paid over time, 1/20 of the principal and interest on the outstanding balance is due each year.

The assessments and monthly user fees are based upon 2002 construction costs. Depending upon the year of construction, assessments and user fees should be adjusted accordingly.

ESTIMATED COSTS TO THE USERS OF THE SYSTEM

131 Corridor - New Water System

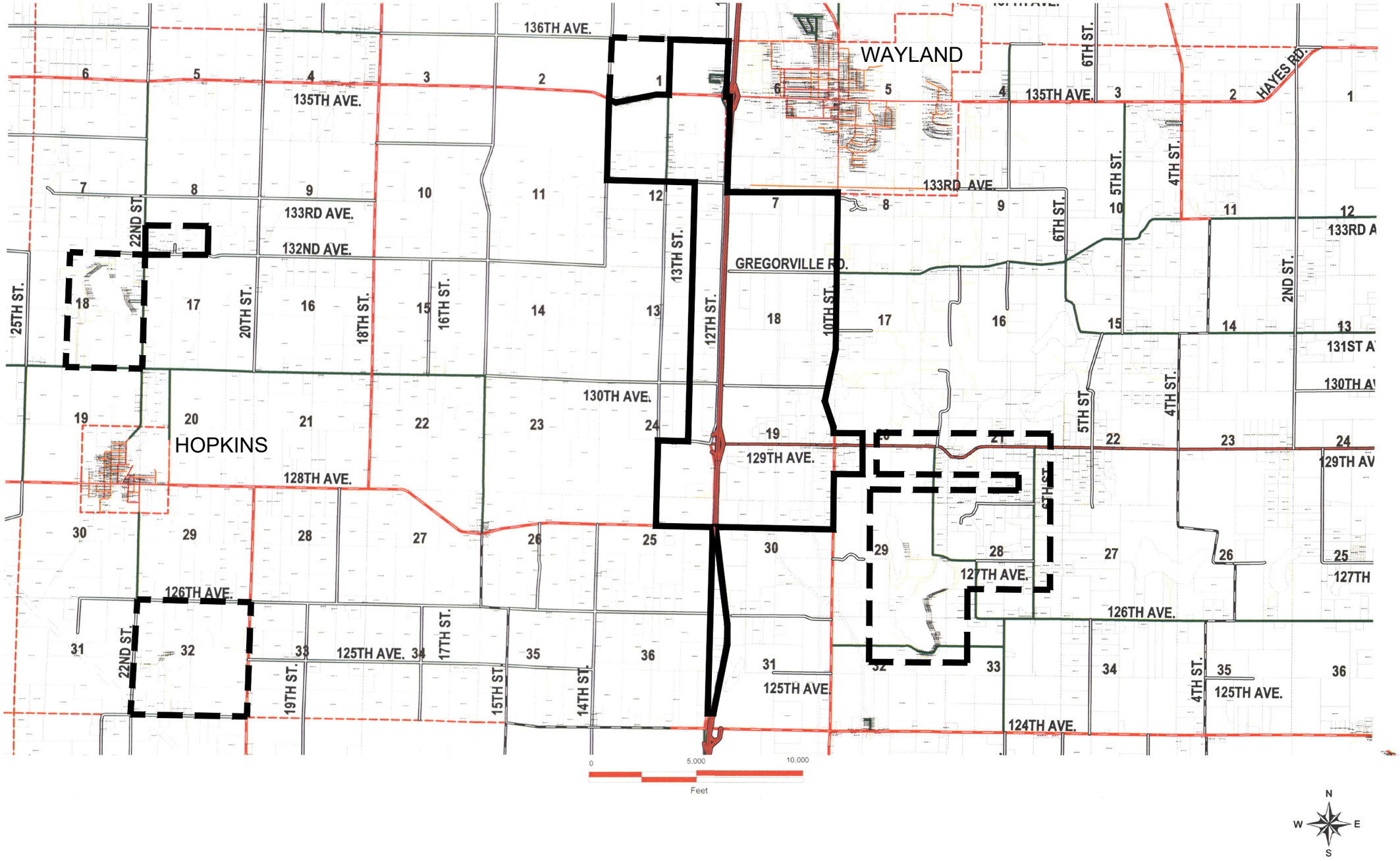
Assessment and Connection Fees		$ 7,000
Capacity Fee		$ 3,000
	TOTAL	**$ 10,000**
Operation, Maintenance & Replacement Monthly User Fee/REU		$ 35
Monthly Debt Service Charge/REU		$ 340
	TOTAL MONTHLY	**$ 375**

Notes: Assumes 6.5% interest on assessments and 5.5% interest on bonds over 20 years.

The above assessments and connection fees can be paid in cash or over a 20 year period with interest. When the assessments and connection fees are paid over time, 1/20 of the principal and interest on the outstanding balance is due each year.

The assessments and monthly user fees are based upon 2002 construction costs. Depending upon the year of construction, assessments and user fees should be adjusted accordingly.

hopwayFIG1 / bsr090902/ 1



INITIAL SERVICE AREA

FUTURE SERVICE AREA

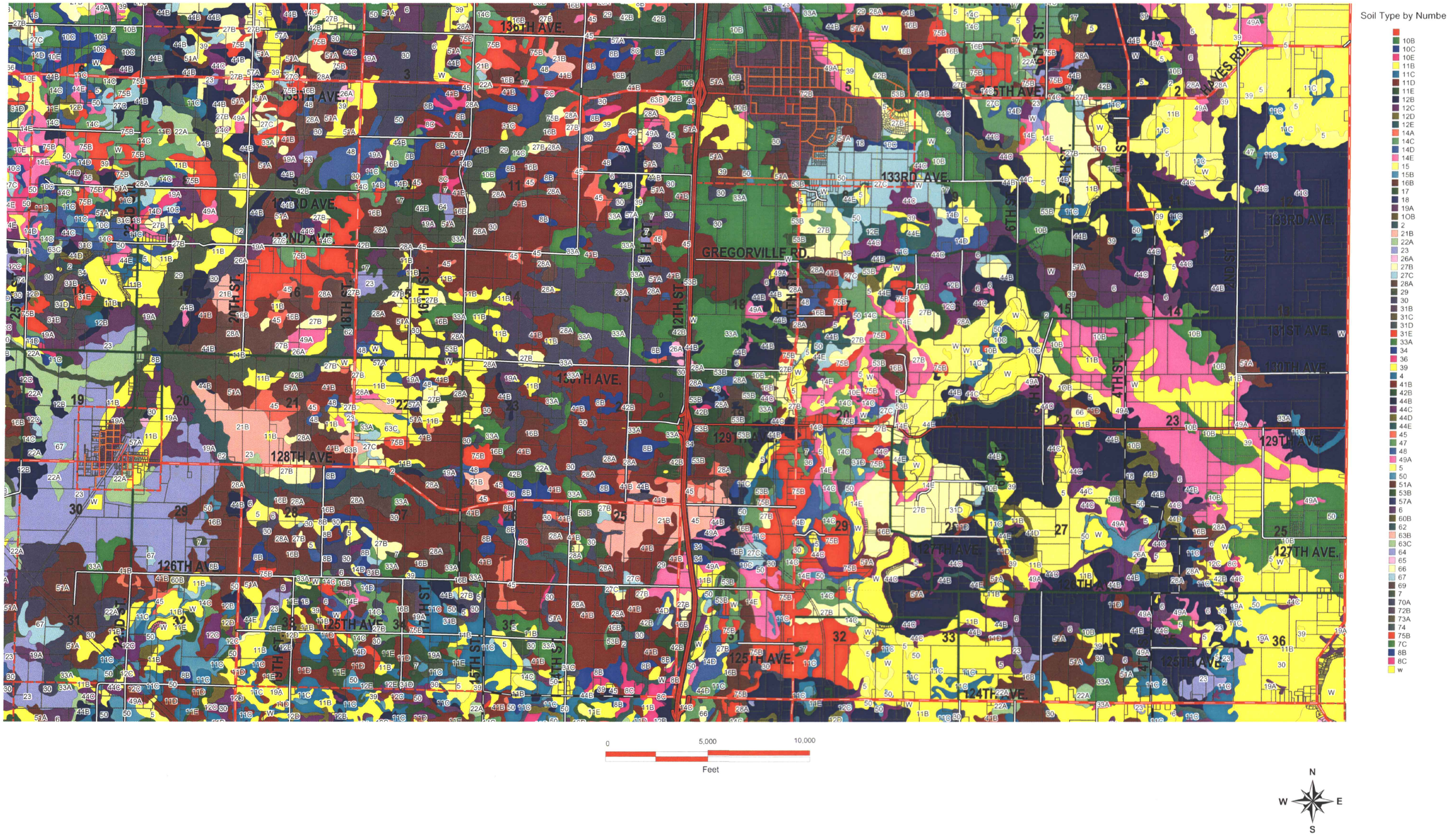
HOPKINS and WAYLAND TOWNSHIPS
ALLEGAN COUNTY

STUDY AREA
INITIAL & FUTURE SERVICE AREAS
FIGURE 1

2002 14052

FLEIS & VANDENBRINK ENGINEERING, INC.

hopwayFIG1 / pd032702 / 1



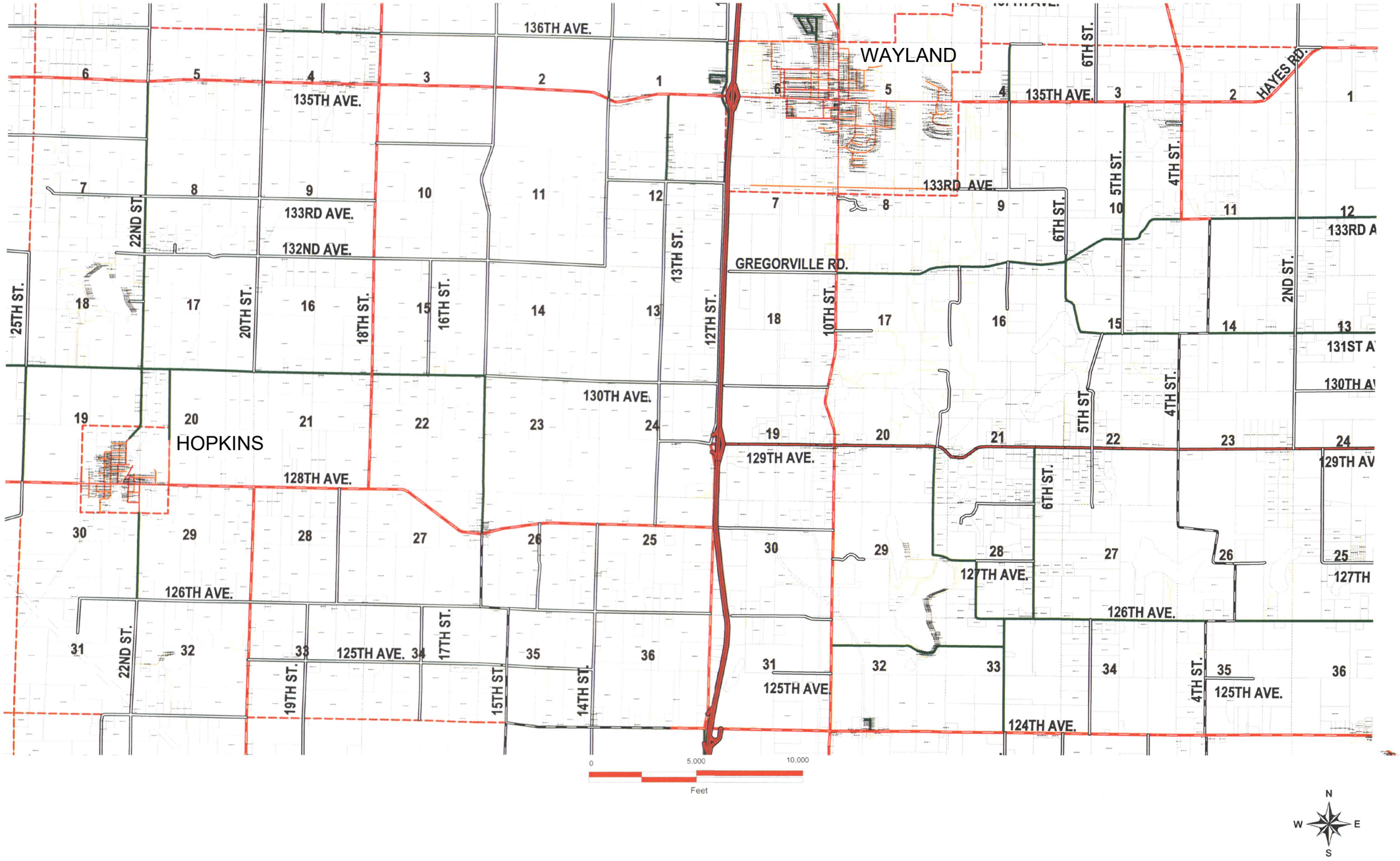
HOPKINS and WAYLAND TOWNSHIPS
ALLEGAN COUNTY

SOILS MAP
FIGURE 2

2002 14052

FLEIS & VANDENBRINK ENGINEERING, INC.

hopwayFIG3 / bsr090902 / 1



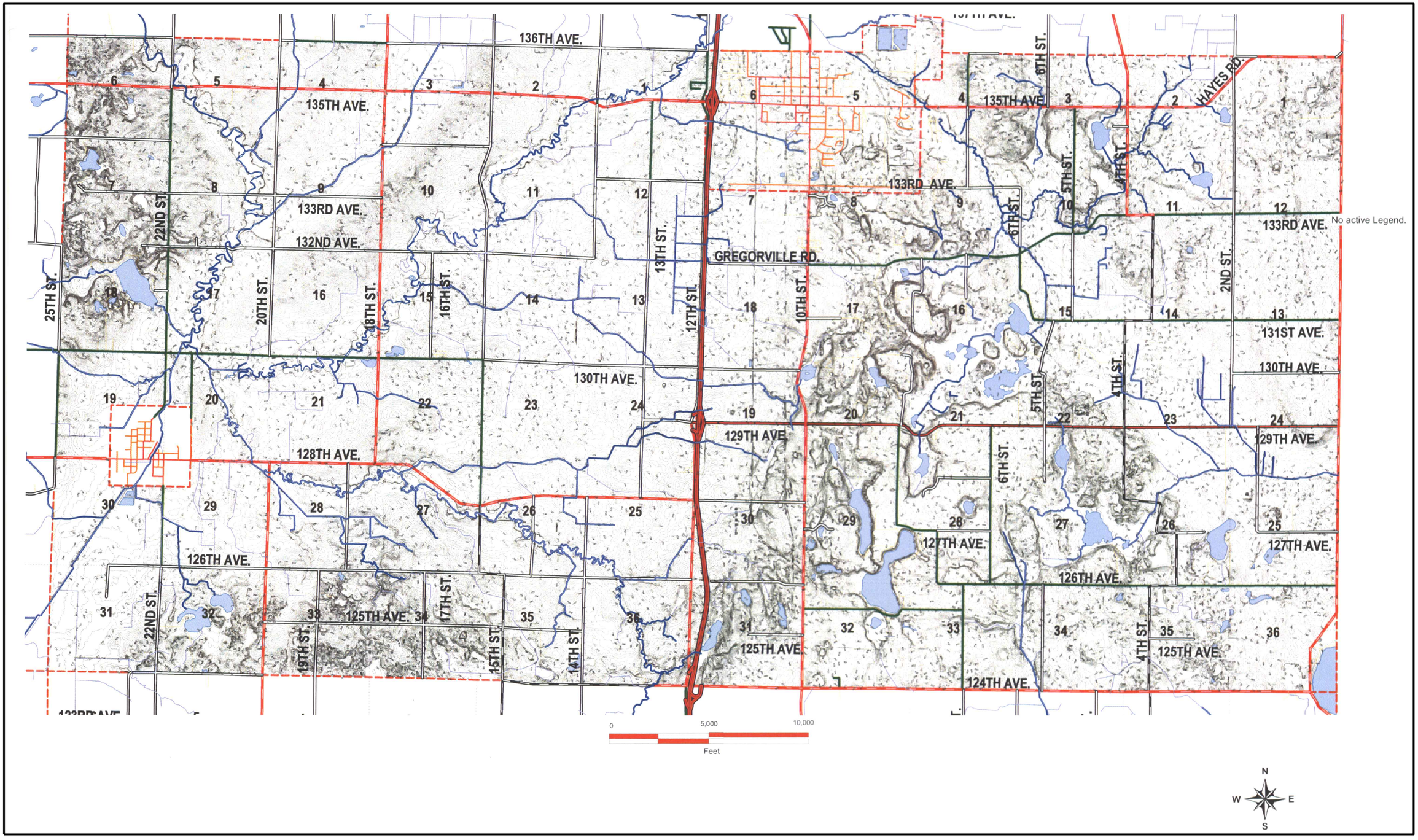
HOPKINS and WAYLAND TOWNSHIPS
ALLEGAN COUNTY

PARCELS
FIGURE 3

2002 14052

FLEIS & VANDENBRINK ENGINEERING, INC.

hopwayFIG3 / pd032702 / 1



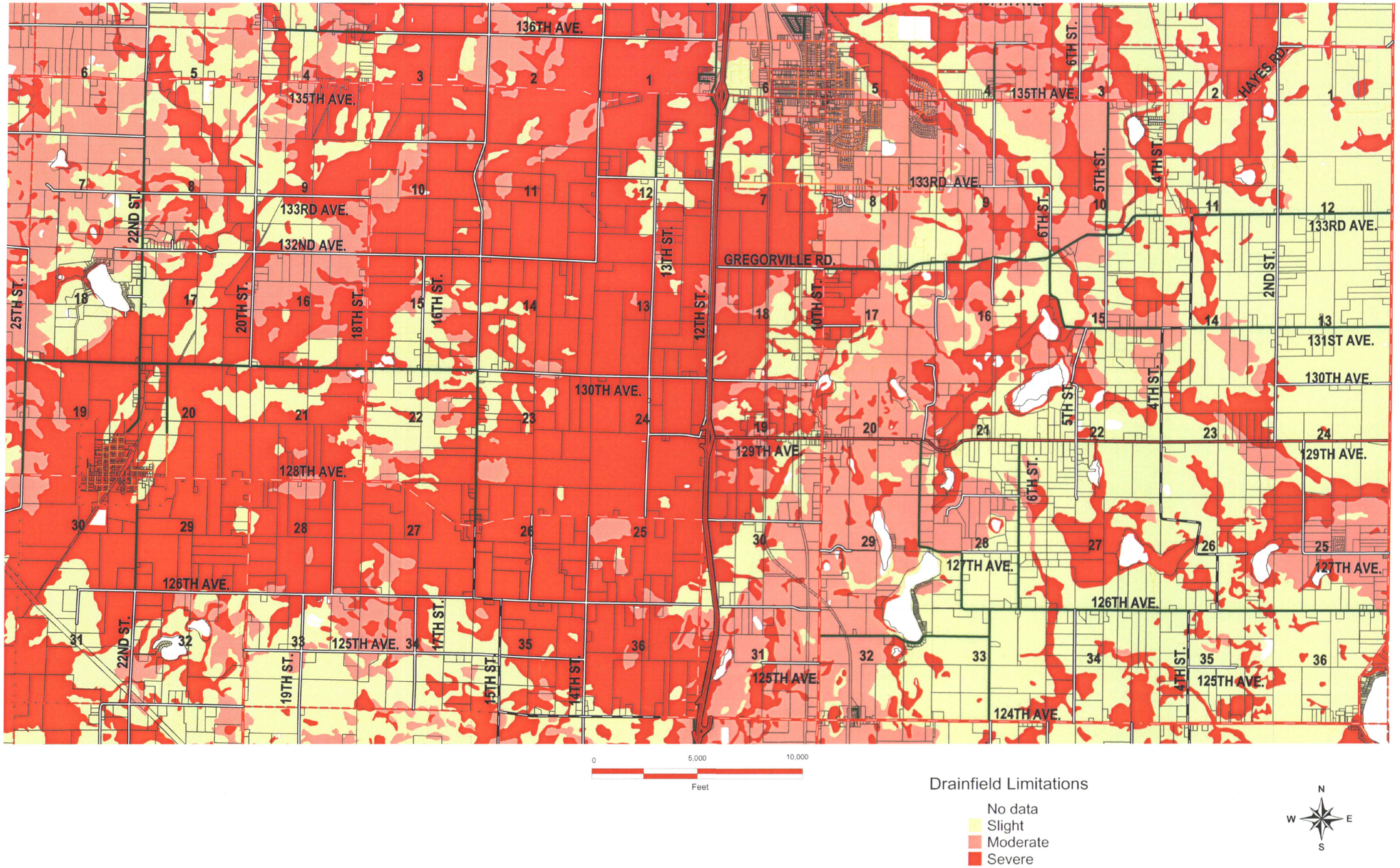
No active Legend.

HOPKINS and WAYLAND TOWNSHIPS
ALLEGAN COUNTY

2 FOOT CONTOURS MAP
FIGURE 4

2002 14052

FLEIS & VANDENBRINK ENGINEERING, INC.



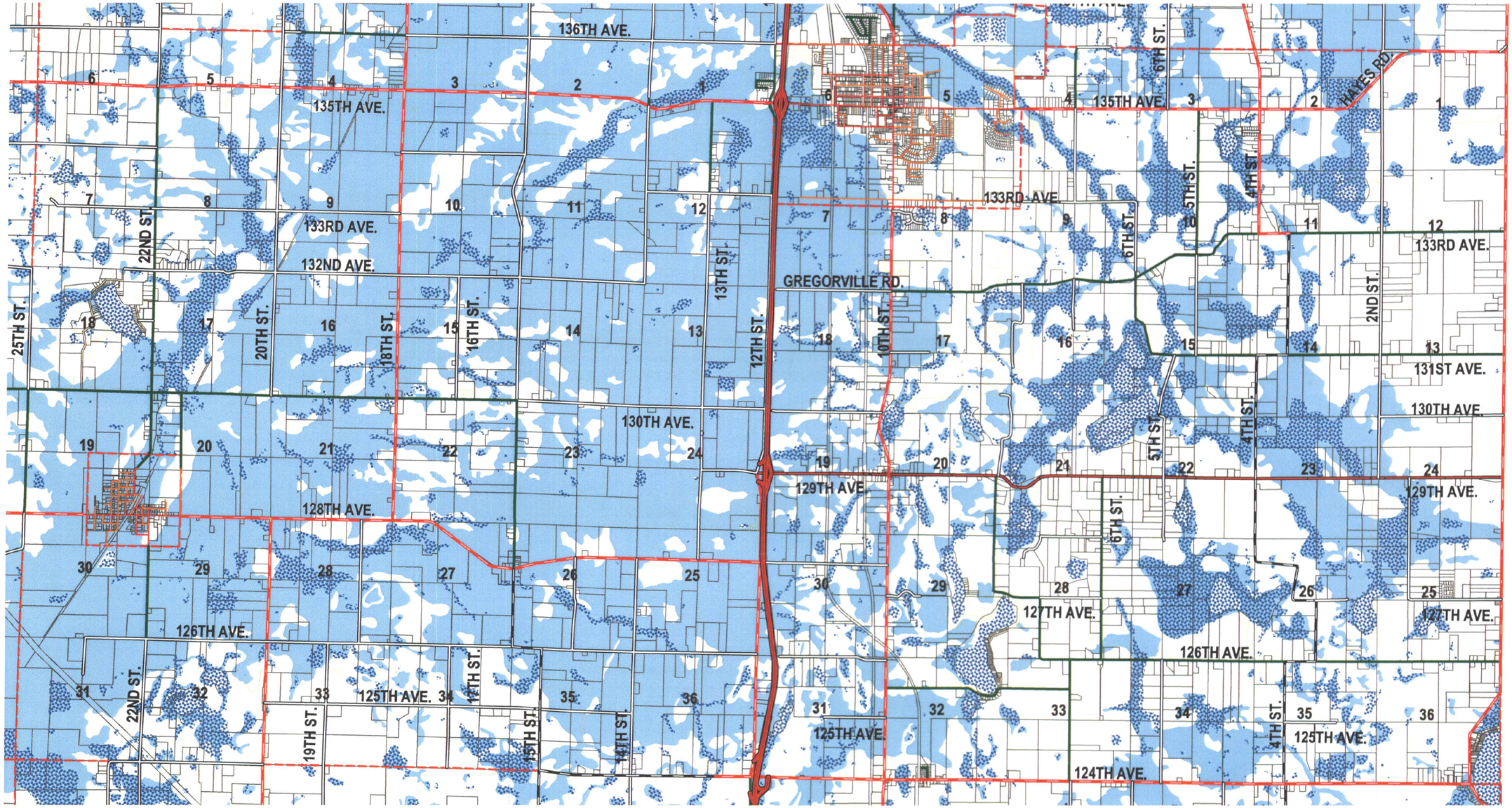
HOPKINS and WAYLAND TOWNSHIPS
ALLEGAN COUNTY

FLOODPLAINS MAP
FIGURE 5

2002 14052

FLEIS & VANDENBRINK ENGINEERING, INC.

hopwayFIG5 / pd032702 / 1



0 5,000 10,000
Feet

Legend

Source: USDA Soil Service & National Wetlands Inventory

Hydric Soils

Wetlands

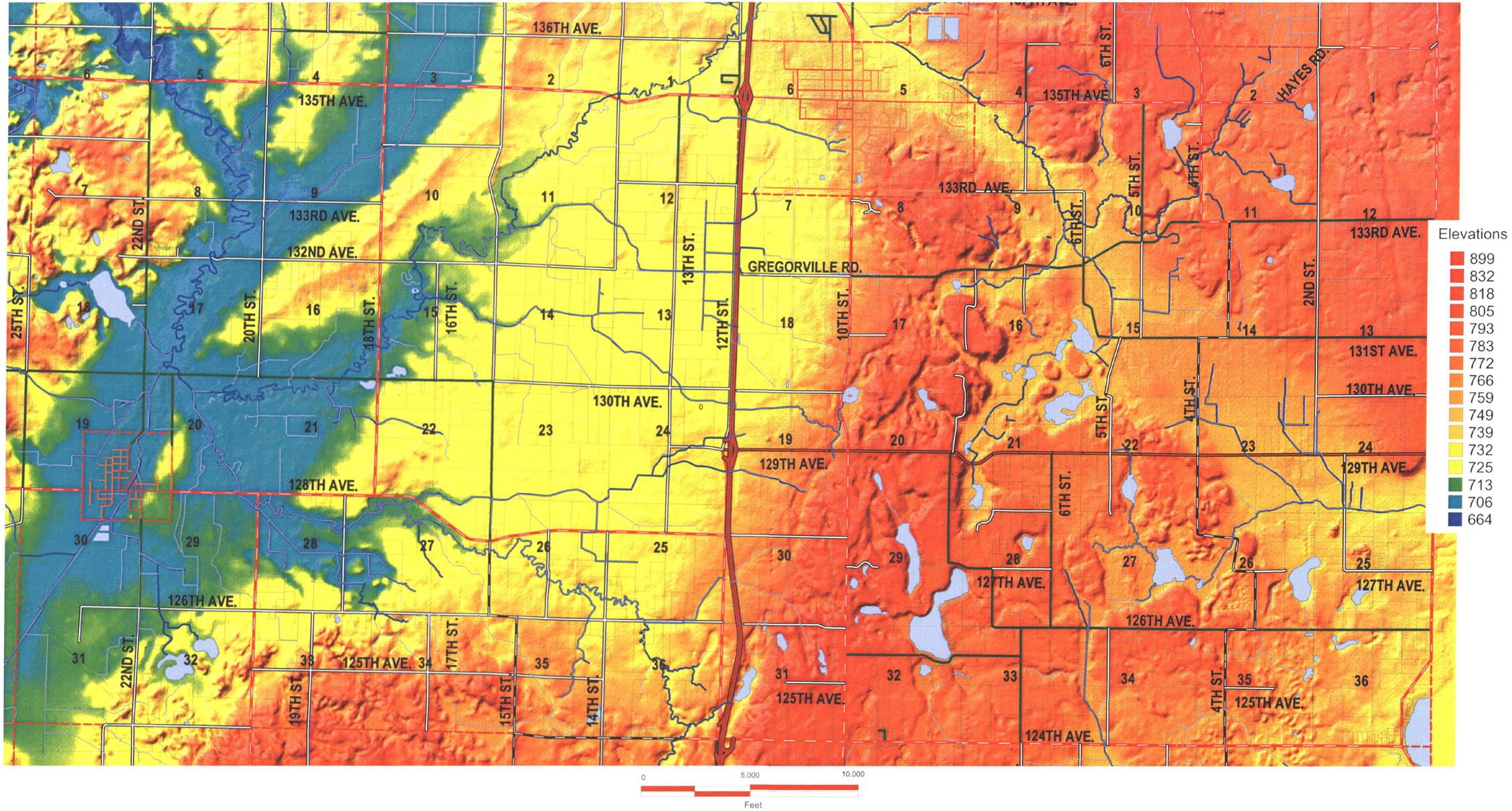
HOPKINS and WAYLAND TOWNSHIPS
ALLEGAN COUNTY

HYDRIC SOILS and WETLANDS MAP
FIGURE 6

2002 14052

FLEIS & VANDENBRINK ENGINEERING, INC.

hopwayFIG6 / pd032702 / 1



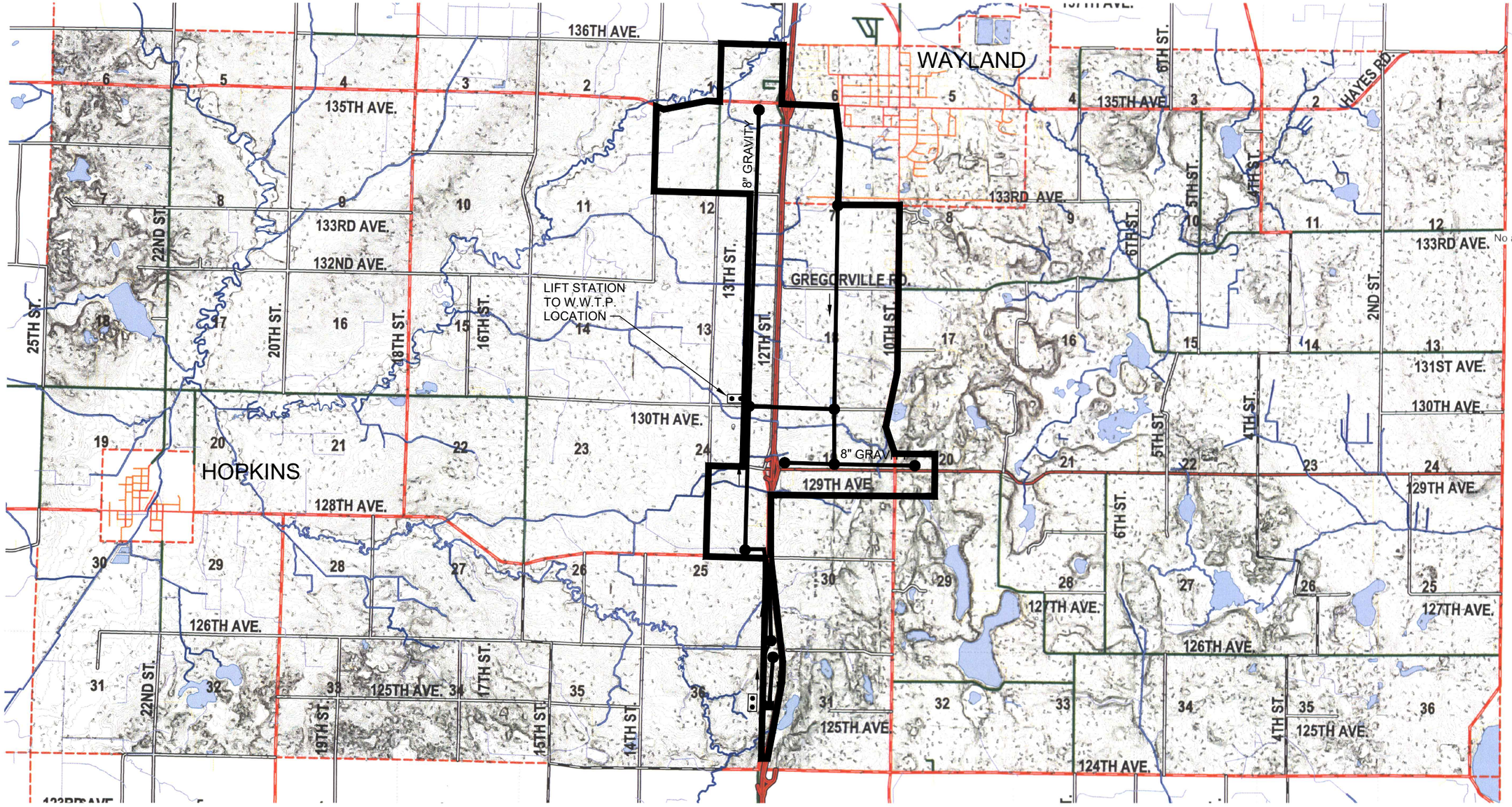
HOPKINS and WAYLAND TOWNSHIPS
ALLEGAN COUNTY

GEOGRAPHIC RELIEF MAP
FIGURE 7

2002 14052

FLEIS & VANDENBRINK ENGINEERING, INC.

hopwayFIG8 / JDB053102 / 1



LEGEND

= LIFT STATION

= FORCEMAIN

= GRAVITY SEWER

HOPKINS and WAYLAND TOWNSHIPS

ALLEGAN COUNTY

INTIAL SERVICE AREA SEWER SYSTEM

CONVENTIONAL GRAVITY

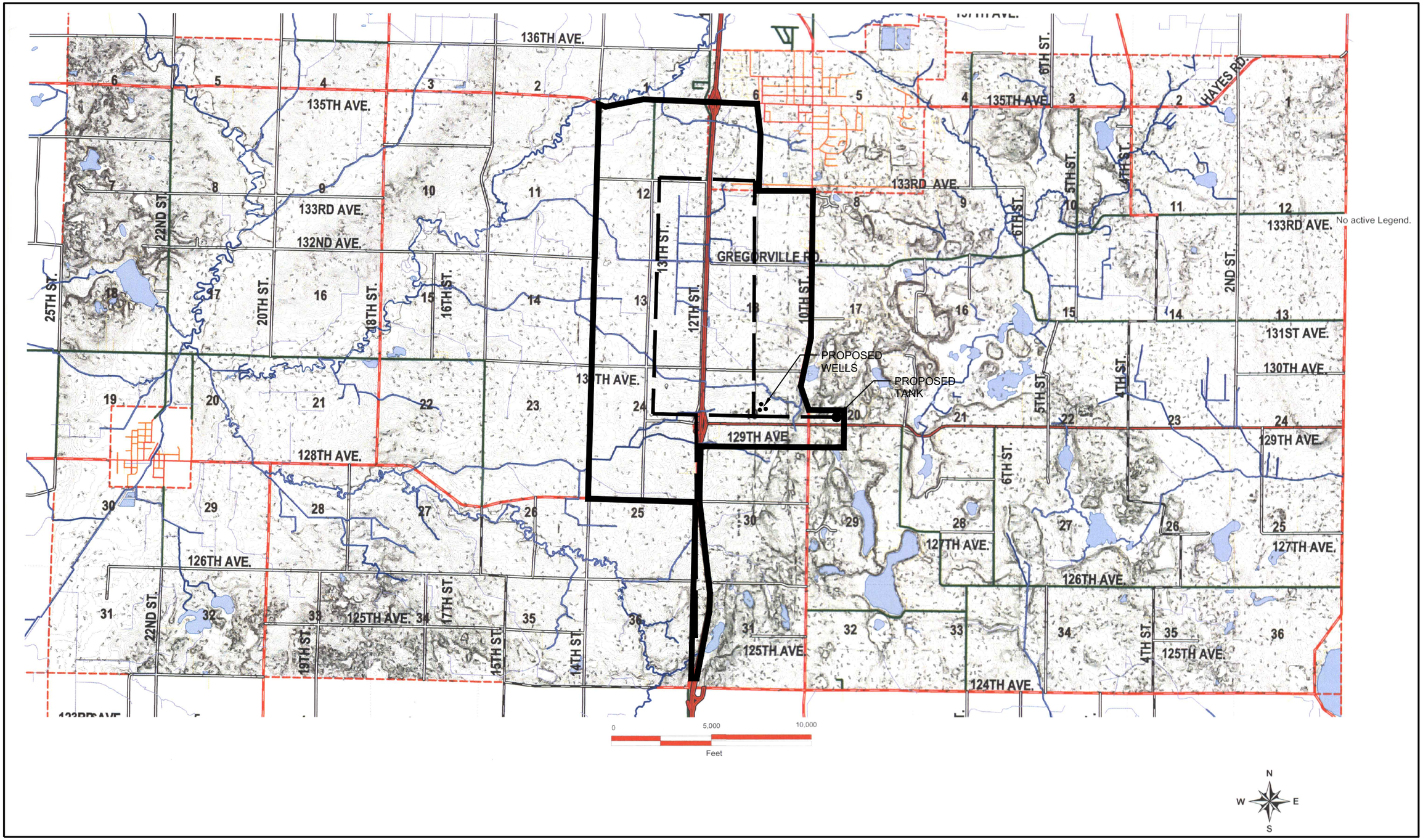
FIGURE 8

2002

14052

FLEIS & VANDENBRINK ENGINEERING, INC.

hopwayFIG10 / JDB053102 / 1



HOPKINS and WAYLAND TOWNSHIPS
ALLEGAN COUNTY

INTIAL SERVICE AREA WATER SYSTEM
FIGURE 9

2002 14052

FLEIS & VANDENBRINK ENGINEERING, INC.

FLEIS&VANDENBRINK
DESIGN. BUILD. OPERATE.

June 12, 2020

Mark Evans, Supervisor
Hopkins Township
128 South Franklin Street
Hopkins, Michigan 49348

RE: Feasibility & Cost Analysis – US 131 Corridor Sanitary Sewer

Dear Mark:

Fleis & VandenBrink Engineering (F&V) has evaluated alternatives to provide sanitary sewer service to Township property owners along the US 131 corridor. This corridor generally includes those properties in a 2.5 mile stretch, along 12th Street from 135th Avenue to 130th Avenue and shown as the service area in Figure 1 attached.

Future land use of the service area is comprised of existing homes, industrial, commercial, and residential. 50% of the land currently zoned for agriculture was identified for commercial in future use and the other 50% for future residential. Existing land zoned for industrial and residential was assumed to remained zoned the same. Assumptions for average day flow generated by each type of land use is shown below in Table 1. Evaluation of initial, 100% built out, and build out conditions in 5-year increments can be seen in the Basis of Design attached.

Table 1. Average Day Wastewater Flow Assumptions.

Land Use	Avg Day Flow
Commercial (gpd/ac)	2,000
Industrial (gpd/ac)	1,500
Residential (gpd/ac)	750
Existing Home (gpd/ea)	250

COLLECTION SYSTEM

Sanitary sewer collection systems were evaluated to carry the wastewater from the service area to the proposed treatment plant. Two collection system options were evaluated, one option flows north to a wastewater treatment plant at the northern end of the service area and another option flows south to a wastewater treatment plant at the southern end of the service area.

A collection system to carry the wastewater to a treatment plant at the northern end of the service area would be comprised of a series of gravity sewers, pump stations, and forcemain. In general, the existing ground slopes towards the middle of the service area along 12th Street. For this reason, gravity sewer would flow from both ends of the service area to a pump station that would then pump to the north end where gravity sewer can continue to flow north. A second pump station would be required south of 135th Avenue to continue the wastewater to the treatment plant. This option is depicted in Figure 2.

2960 Lucerne Drive SE
Grand Rapids, MI 49546
P: 616.977.1000
F: 616.977.1005
www.fveng.com

A second collection system was evaluated to carry the wastewater to a treatment plant at the southern end of the service area. This collection system was comprised of a series of gravity sewers, pump station, and forcemain. As stated above because the existing ground slopes towards the middle of the service area along 12th Street the gravity sewer would flow from both directions to a pump station. This pump station would then pump south to the treatment plant. A second pump station would be required to transport wastewater at the north end of the service area to a location where it can then flow by gravity. This option is depicted in Figure 3.

Gravity sewer sizes are based on full build out conditions, as gravity sewer has an estimated useful life of 75 years. The pump stations and forcemain was sized for 20 year build out conditions. At this point the pumps and forcemain could be sized larger, if necessary, to accommodate additional flow.

WASTEWATER TREATMENT FACILITY

There are many variables and development scenarios affecting the design of the Wastewater Treatment Facility (WWTF). Alternatives for the treatment facility were reviewed using the projected five-year that will allow for expansion to the projected 20-year flow in the future. In five years, it is assumed that 20% of the industrial/commercial development that is being projected for the built out has occurred. This flow also includes the current domestic flow plus a 10% utilization of estimated available residential capacity. Under this scenario, the wastewater treatment system will need to be able to treat an estimated 125,000 gpd. For the projected twenty-year flows, it is assumed that 50% of the industrial/commercial development that is being projected build out has occurred. This flow also includes the current domestic flow plus a 40% utilization of estimated available residential capacity. Under this design scenario, the WWTF would need to be expanded to be able to treat 320,000 gpd.

Two types of treatment facilities were considered for this size project, including mechanical treatment and lagoon treatment. We recommend a mechanical treatment system be utilized, because such systems have proven to be cost-effective to meet the anticipated treatment requirements for the range of flow rates identified in the 5-year to 20-year design, have smaller site size requirements, and allow for expansion to meet the projected future flow rates as the area is developed.

Two alternatives for discharge of treated water (effluent) from the treatment facility were considered: surface water discharge and groundwater discharge. Effluent parameters for both discharge options will be achievable with a mechanical treatment facility. Anticipated effluent limits are shown in Table 2 below.

With a surface water discharge, the treated effluent from any wastewater treatment process will discharge through a pipe into the Rabbit River (either directly to the river or via the Buskirk Creek). As a basis for the cost estimate, the discharge limit parameters similar to the existing treatment facilities in the area were assumed.

Discharges to groundwater are regulated under Act 451 of the Public of 1994, Part 22. Two options for groundwater discharges include: applying the treated effluent to the surface of rapid infiltration beds (RIBs) and allowing the effluent to percolate into the soil; or irrigating the treated effluent on agricultural crops and again letting the effluent percolate into the soil. Discharge using RIBs was used as a basis for the cost estimate because irrigation would require storage of treated effluent during the winter months which would be cost prohibitive at a mechanical treatment facility. However, RIBs require permeable soil to allow the effluent to percolate. Hopkins Township has limited areas of highly permeable soils, which will require the use of larger infiltration beds to be constructed. While a groundwater discharge requires the construction of an additional unit process, it allows for additional polishing of the treated effluent (specifically nitrogen and phosphorus) for nutrient control and has more favorable effluent limits compared to a surface water discharge.

*Table 2. Anticipated Effluent Limits**

Surface Water Discharge (Summer Months)	
30-Day Avg cBOD5	<4 mg/L
30-Day Avg Ammonia Nitrogen	<0.5 mg/L
30-Day Avg Total Phosphorus	<0.1 mg/L
Total Suspended Solids	<20 mg/L
Groundwater Discharge	
30-Day Avg $cBOD_5$	<10 mg/L
30-Day Avg Total Inorganic Nitrogen	<5.0 mg/L
30-Day Avg Total Phosphorus	<1.0 mg/L

*Actual discharge limits are subject to change until the groundwater discharge permit is finalized during design

Other considerations include industrial wastewater treatment needs, residuals management and facility growth capacity/reliability. For the purposes of this cost estimate, the following is assumed:

1. Any industrial wastewater discharged to the sanitary sewer system would be pretreated and the average wastewater received at the facility would be normal municipal strength.
2. Solids treatment would be aerobically stabilized and disposed of on a semi-annual basis by land applying the biosolids on farm fields. Alternatively, the solids could be dried and disposed of in a landfill.
3. Each of the alternatives would provide for growth as the service area is developed over 20 years. As the service area is developed beyond 20 years, additional capital expenditures will be required to expand the treatment capacity of the facility.

Property Rights

Property rights will need to be obtained for various components of the sewer system. The piping in 12th Street and adjoining streets will be in public rights-of-way (ROW) and therefore already have the rights needed. The two pump stations for either option have the potential to be in the ROW if there is adequate space. Adequate space will be determined by ROW width, existing utilities, and pump station configuration. If there is not adequate space for the pump stations, property rights can be obtained by easements. The WWTF will need the acquisition of approximately 40 acres through property ownership.

If a groundwater discharge for the WWTF is selected, a hydrogeologic study should be completed prior to purchasing property to confirm the site is suitable for a groundwater discharge.

Cost Estimates

The preliminary opinion of probable cost to provide sanitary sewer to the service area is shown in Table 3 below. The total cost includes non-construction project costs such as land purchase, design and construction engineering, permitting, legal and bond counsel. Annual operating costs for the sanitary sewer system are not included in this estimate. This estimate represents conceptual estimates in 2021 dollars to be used for planning purposes. Further definition of the scope of the project through preliminary and final design will provide details necessary to improve the accuracy of conceptual estimates. Detailed cost estimates are attached.

Table 3. Project Cost Estimate

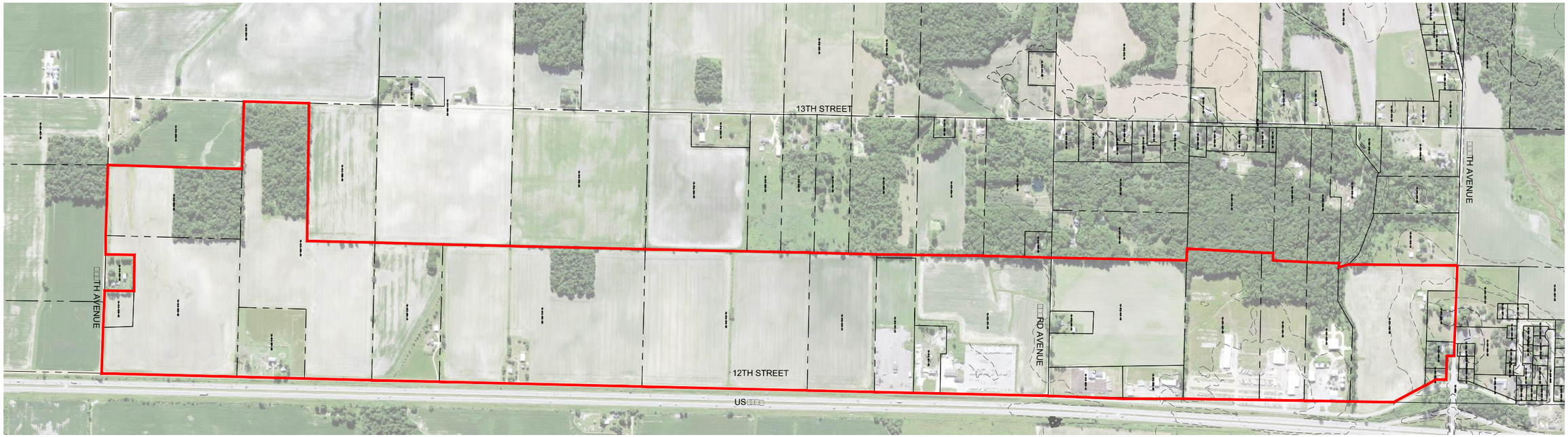
Description	Amount
Collection System and WWTF (North) with surface water discharge	$14,600,000
Collection System and WWTF (South) with surface water discharge	$15,300,000
Collection System and WWTF (North) with groundwater discharge	$14,000,000

Sincerely,

FLEIS & VANDENBRINK

Steven M. Bishop, PE
Project Manager

Attachments: Figures 1-3, Basis of Design, Cost Estimate



NORTH

LEGEND

SERVICE AREA

HOPKINS TOWNSHIP

ALLEGAN COUNTY

SEWER SERVICE AREA

FIGURE 1

F&V PROJECT NO. 844150

F&V

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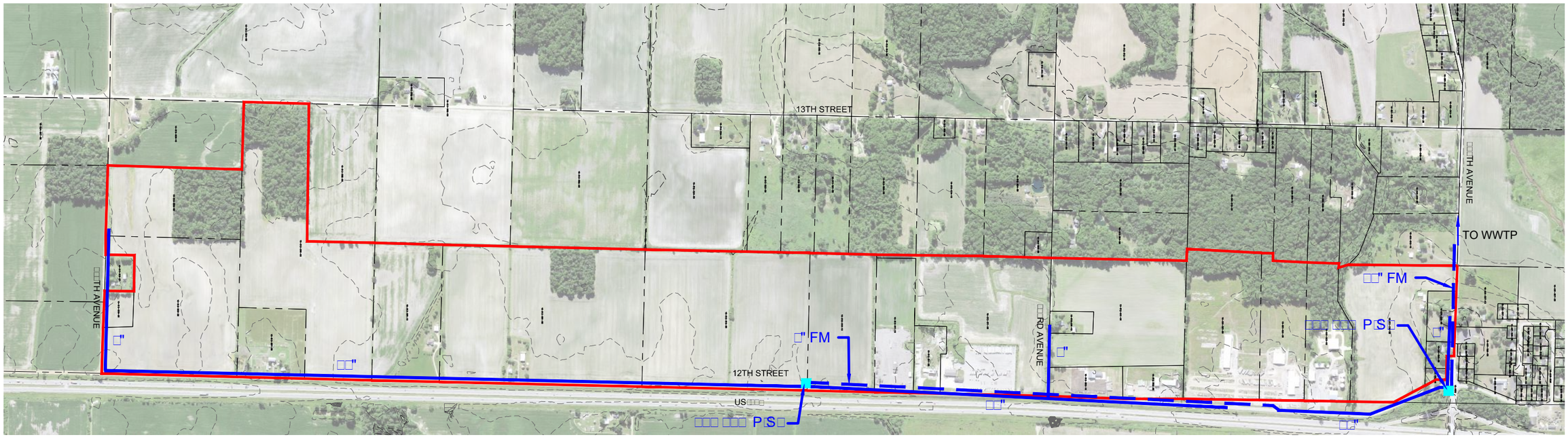

LEGEND

SERVICE AREA

GRAVITY SEWER

FORCEMAIN

PUMP STATION

HOPKINS TOWNSHIP

ALLEGAN COUNTY

SEWER LAYOUT- WWTP NORTH

FIGURE 2

F&V PROJECT NO. 844150

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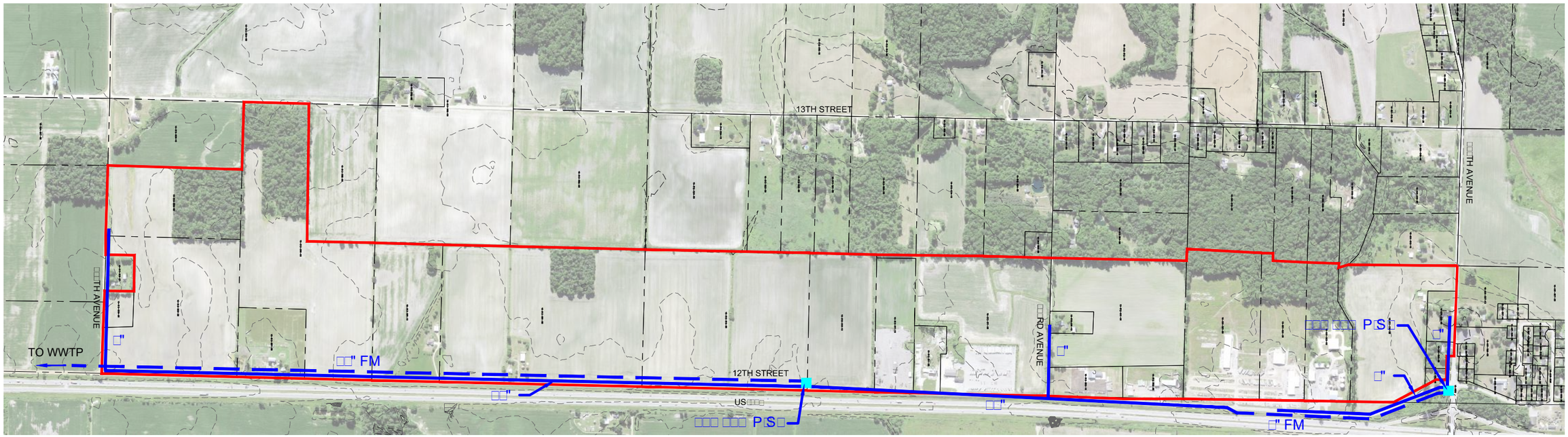

NORTH

LEGEND

SERVICE AREA

GRAVITY SEWER

FORCEMAIN

PUMP STATION

HOPKINS TOWNSHIP

ALLEGAN COUNTY

SEWER LAYOUT- WWTP SOUTH

FIGURE 3

F&V PROJECT NO. 844150

F&V

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Hopkins Township

Basis of Design

Project No. 844150
Engineer: DKS
Date: 06/10/2020

FUTURE LAND USE	INITIAL SIZE (ACRES)	INITIAL WASTEWATER (GPD)	FUTURE SIZE (ACRES)	BUILT- OUT WASTEWATER (GPD)	FUTURE PERCENT DEVELOPMENT (IN YEARS); BASE YEAR 2021					FUTURE FLOW (GPD) (IN YEARS); BASE YEAR 2021				
					0-5	6-10	11-15	16-20	21-25	0-5	6-10	11-15	16-20	21-25
Residential	0	0	138	103,500	10%	20%	30%	40%	50%	10,350	20,700	31,050	41,400	51,750
Existing Home	18	1,250	18	1,250	100%	100%	100%	100%	100%	1,250	1,250	1,250	1,250	1,250
Commercial	4	8,000	188	376,000	20%	30%	40%	50%	60%	75,200	112,800	150,400	188,000	225,600
Stoddard*	12	8,000	12	20,000	40%	50%	100%	100%	100%	8,000	10,000	20,000	20,000	20,000
Industrial	43	64,500	90	135,000	20%	30%	40%	50%	60%	27,000	40,500	54,000	67,500	81,000
Total Average Daily Flow (gpd)		**81,750**		**635,750**						**121,800**	**185,250**	**256,700**	**318,150**	**379,600**
Peak Daily Flow; 2.8 peaking factor (gpd)		**228,900**		**1,780,100**						**341,040**	**518,700**	**718,760**	**890,820**	**1,062,880**

* The Stoddard property has been listed seperately because of its high flow relative to the property footprint due to the oil recyling industry located here. This basis of design assumes the wastewater will be pretreated and discharged to the collection system.

Hopkins Township

US 131 Corridor Sanitary Sewer Feasibility Study

WWTF North

Project Cost Estimate

FLEIS&VANDENBRINK engineering

Job:	844150
By:	DKS
Date:	6/12/2020

Description[1]	Size	Unit	Qty.	Unit Price[2]	Amount
Wastewater Treatment Facility	125,000 gpd	LS	1	$4,700,000	$4,700,000
Gravity Sewer	8"	Ft	2,850	$170	$484,500
	10"	Ft	4,100	$200	$820,000
	12"	Ft	6,850	$230	$1,575,500
	18"	Ft	1,750	$280	$490,000
Forcemain	8"	Ft	5,000	$115	$575,000
	10"	Ft	3,000	$126	$378,000
Pump Station	500 gpm	Each	1	$575,000	$575,000
	650 gpm	Each	1	$630,000	$630,000
				Subtotal (Rounded)	**$10,200,000**
Contingency (20%)					$2,040,000
				Subtotal (Rounded)	**$12,200,000**
Engineering (15%)					$1,830,000
Bonding					$36,600
Legal					$40,000
Property Acquisition					$500,000
				Total (Rounded)	**$14,600,000**

[1] Unit price includes grass restoration only. Surface restoration including paving and road reconstruction are not included or anticipated

[2] All costs are 2021 dollars.

Hopkins Township

US 131 Corridor Sanitary Sewer Feasibility Study

WWTF South

Project Cost Estimate

FLEIS&VANDENBRINK engineering

Job:	844150
By:	DKS
Date:	6/12/2020

Description[1]	Size	Unit	Qty.	Unit Price[2]	Amount
Wastewater Treatment Facility	125,000 gpd	LS	1	$4,700,000	$4,700,000
Gravity Sewer	8"	Ft	4,600	$170	$782,000
	12"	Ft	10,950	$230	$2,518,500
Forcemain	4"	Ft	2,200	$70	$154,000
	10"	Ft	10,650	$126	$1,341,900
Pump Station	150 gpm	Each	1	$575,000	$575,000
	650 gpm	Each	1	$630,000	$630,000
				Subtotal (Rounded)	**$10,700,000**
Contingency (20%)					$2,140,000
				Subtotal (Rounded)	**$12,800,000**
Engineering (15%)					$1,920,000
Bonding					$25,000
Legal					$40,000
Property Acquisition					$500,000
				Total (Rounded)	**$15,300,000**

[1] Unit price includes grass restoration only. Surface restoration including paving and road reconstruction are not included or anticipated

[2] All costs are 2021 dollars.

Hopkins Township

US 131 Corridor Sanitary Sewer Feasibility Study

WWTF - Groundwater Discharge
Project Cost Estimate

FLEIS&VANDENBRINK engineering

Job:	844150
By:	DKS
Date:	6/12/2020

Description[1]	Size	Unit	Qty.	Unit Price[2]	Amount
Wastewater Treatment Facility	125,000 gpd	LS	1	$4,400,000	$4,400,000
Gravity Sewer	8"	Ft	2,850	$170	$484,500
	10"	Ft	4,100	$200	$820,000
	12"	Ft	6,850	$230	$1,575,500
	18"	Ft	1,750	$280	$490,000
Forcemain	8"	Ft	5,000	$115	$575,000
	10"	Ft	6,500	$126	$819,000
Pump Station	500 gpm	Each	1	$575,000	$575,000
	650 gpm	Each	1	$630,000	$630,000
				Subtotal (Rounded)	**$10,400,000**
Contingency (20%)					$2,080,000
				Subtotal (Rounded)	**$12,500,000**
Engineering (15%)					$1,875,000
Hydrogeologic Study					$75,000
Bonding					$25,000
Legal					$40,000
Property Acquisition					$500,000
				Total (Rounded)	**$15,000,000**

[1] Unit price includes grass restoration only. Surface restoration including paving and road reconstruction are not included or anticipated

[2] All costs are 2021 dollars.

FLEIS&VANDENBRINK
DESIGN. BUILD. OPERATE.

June 15, 2020

Mark Evans, Supervisor
Hopkins Township
142 W. Main Street
Hopkins, Michigan 49328

Re: USDA Rural Development Application – Wastewater Collection & Treatment System

Dear Mark:

Fleis & VandenBrink (F&V) is pleased to present this proposal to assist Hopkins Township (Township) with a USDA Rural Development (RD) funding application. As you know, F&V has recently evaluated serving the properties west of and adjacent to US-131 culminating in a report dated June 12, 2020. As discussed during our recent Zoom meeting, this proposal includes work to apply for Federal Assistance to fund the project through RD.

WORK PLAN

USDA RURAL DEVELOPMENT APPLICATION

The below list of items was developed by RD and required for their application process:

1. Prepare form SF-424 application for Federal Assistance, including project narrative, map, and preliminary project budget.
2. Prepare State and Regional Clearinghouse letters.
3. Assist the Township with the certification regarding commercial credit.
4. Include the Township's most recent audit in the application package.
5. Assist the Township in publishing a Public Notice stating that the Township intends to apply for funding through the USDA. The notice must be published in the local newspaper. Costs for publishing are not included in our fee presented below.
6. Compile the required Customer information and user rate schedule with Township assistance.
7. Document the Median Household Income.
8. Assist with documentation of other potential sources of funding.
9. Assist the Township in providing documentation that the proposed sewer system is consistent with area comprehensive development plan(s).
10. Prepare a Preliminary Engineering Report (PER) consistent with USDA-RD's guideline for PER's.
11. Environmental Report:
    - Assist the Michigan Rural Community Assistance Partnership (RCAP) in their preparation of the Environmental Report. We understand that RCAP is preparing this report and our involvement with its preparation will be limited to its coordination.
12. Prepare the draft engineering agreement on USDA-RD's standard form of agreement.
13. Prepare or coordinate the preparation of the draft legal services agreement.
14. Assist the Township in the obtaining or recertifying their DUNS number.

2960 Lucerne Dr. SE, Suite 100
Grand Rapids, MI 49546
P: 616.977.1000
www.fveng.com

BUDGET

F&V proposes to complete the Rural Development Application for a **Lump Sum Fee of $20,000.**

We understand the requirements and processes of the USDA program and the nuances of completing an application and administering a project successfully. We have a solid track record of managing USDA projects and completing the heavy lifting of project administration so that your staff is not burdened with large amounts of extra work. We strive to serve in our role administering the USDA project as an extension of your staff.

F&V appreciates the opportunity to be of service to Hopkins Township. If you need any additional information, please do not hesitate to contact us.

Sincerely,

FLEIS & VANDENBRINK

Steven M. Bishop, P.E.
Project Manager

Don DeVries, P.E.
Group Manager

WORK AUTHORIZATION

Fleis & VandenBrink is approved to proceed with the Scope of Services presented in this proposal as an additional service under the professional services agreement signed May 5, 2020.

HOPKINS TOWNSHIP

_____ _____

Mark Evans, Township Supervisor Date