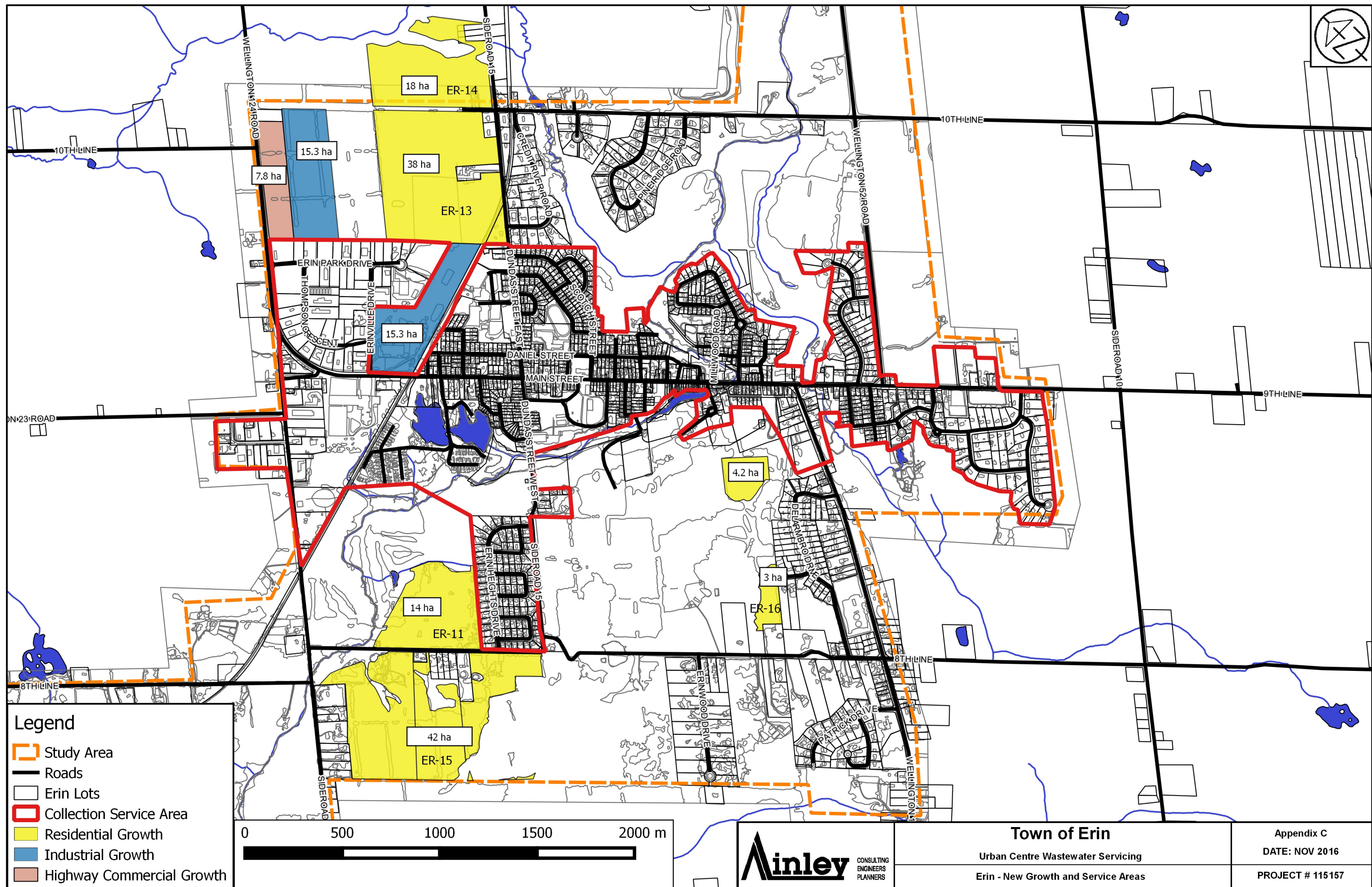
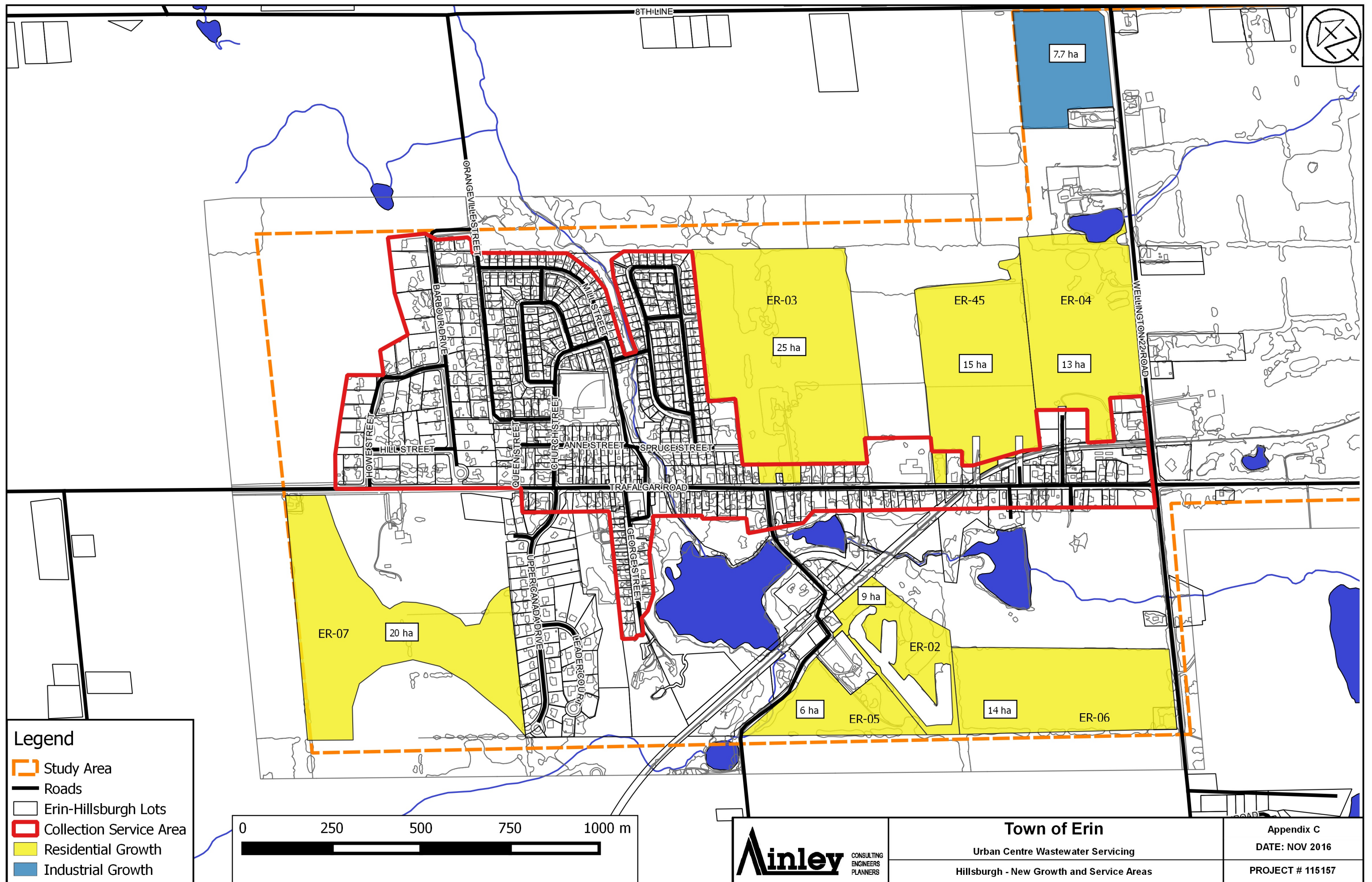


Appendix - C

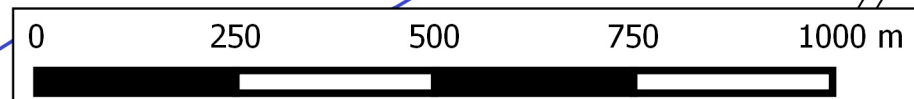
New Growth Areas





Legend

- Study Area
- Roads
- Erin-Hillsburgh Lots
- Collection Service Area
- Residential Growth
- Industrial Growth



Appendix - D

Erin Wastewater Flow Detail

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1.0 Erin Wastewater Flow by Area

1.1 Industrial Area

The industrial area in Erin is located at the north end of the town and consists of 87 individual lots primarily located along Thompson Crescent, Erinville Drive, Erin Park Drive, and Pioneer Drive. Based on the Town's GIS database, the total combined area of the industrial lots is approximately 72.4 Ha. The current MOECC design standard for sewage flow estimation of industrial areas is 28 m³/Ha•d. Using the MOECC standard, an estimated 2,026 m³/d of average day sewage flow would be generated from this area at full buildout. At this time, a number of lots remain vacant and the estimated flow from the established industry is 1,297 m³/d, shown in Table D1.

Table D1 - Industrial Area Flow Summary, Pre-modification

Development Type	Number of Lots	Lot Area (Ha)	ADF Estimate (m ³ /d)	Peak Day Estimate (m ³ /d)
Industrial	52	47.0	1,297	3,891

Existing water use data from June 2013 to June 2016 was reviewed for the industrial area. Assuming the maximum yearly consumption of each site, the existing industry uses approximately 84 m³/d suggesting that the design estimations are much too high and are resulting in an over estimation of actual flows. The *maximum* flow from an industrial property in Erin over the time reviewed was 19.4 m³/d, in contrast the *average* flow estimate based on MOECC guidelines is 19.5 m³/d. While the estimates may be excessive for the current use of the area, it is possible that establishing a sanitary network in the town may attract more water intensive industries or will change the habits of the existing users. It is suggested that a compromise between the existing data and design projections be met, the result is shown in Table D2.

In addition to the established industry, a significant amount of land in this area has been identified for future growth. Maps have been provided in **Appendix B** showing the location of the growth areas and the type of development specified in the Town's Official Plan for Erin and Hillsburgh.

Table D2 - Industrial Area Flow Summary, Post-modification

Development Type	Number of Lots	Lot Area (Ha)	ADF Estimate (m ³ /d)	Peak Day Estimate (m ³ /d)
Industrial – Current Day	52	37.0	334	1,002
Industrial – Infill	35	25.2	227	681
Industrial – Intensification (20%)	-	-	67	201
Industrial – New Growth Areas	-	30.6	275.4	826.2
Commercial – New Growth Areas	-	7.8	215.0	655.2
Residential – New Growth Areas	608	38	647	1,941
Total	995	138.6	1,765.4	5,306.4

1.2 Erin Town Core 1

The area designated as Erin Town Core 1 comprises the majority of the village and is primarily residential and downtown commercial development. The area is bounded at the north end by Elora Cataract Trail and on the south end by the West Credit River. The area has 518 individual lots, including 2 schools, and 32 commercial properties. Based on the Town's GIS database the combined area of the commercial properties is approximately 2.5 Ha. The current MOECC design standard for sewage flow estimation of commercial areas is $28 \text{ m}^3/\text{Ha}\cdot\text{d}$. Using the MOECC standard, an estimated $70 \text{ m}^3/\text{d}$ of average day sewage flow would be generated from the commercial portion of this area. For schools, an assumed flow rate of 95 L/student/day is taken. The two schools within this area have a total of 950 students combining for an estimated flow of $90.2 \text{ m}^3/\text{day}$. The remaining lots (residential units) combine for an average day flow of $478.1 \text{ m}^3/\text{d}$, shown in Table D3.

In addition to the established development, a few hectares of land in this area have been identified for future growth. Maps have been provided in **Appendix B** showing the location of the growth areas and the type of development specified in the Town's Official Plan for Erin and Hillsburgh. As communities grow it is typical for some amount of intensification to occur in the core areas, for this reason we have assumed a 10% allowance for intensification.

Table D3 – Erin Town Core 1, Flow Summary

Development Type	Number of Lots	Lot Area (Ha)	ADF Estimate (m^3/d)	Peak Day Estimate (m^3/d)
Residential	484	60.3	478.1	1,769
Commercial	32	2.5	69.0	324.7
Institutional	2	7.7	90.2	333.7
Residential – Infill	30	-	29.6	110.0
Residential – Intensification (10%)	52 ¹	-	51.8	191.7
Total	669	71.5	718.7	2,756.1

¹ Equivalent lots.

1.3 Erin Town Core 2

The area designated as Erin Town Core 2 is at the south end of the town and primarily consists of residential development. The area is bounded at the north end the West Credit River and on the south end by Wellington 124 Rd. The area has 161 individual lots, including 3 commercial properties and 1 school. Based on the Town's GIS database the combined area of the commercial properties is approximately 0.95 Ha. Using the MOECC standard, an estimated $26.6 \text{ m}^3/\text{d}$ of average day sewage flow would be generated from the commercial portion of this area. For schools, an assumed flow rate of 95 L/student/day is taken. The school within this area has 220 students combining for an estimated flow of $20.9 \text{ m}^3/\text{day}$. The remaining lots (residential units) combine for an average day flow of $154.4 \text{ m}^3/\text{d}$, shown in Table D4.

In addition to the established development, a few acres of land in this area have been identified for future growth. Maps have been provided in **Appendix B** showing the location of the growth areas and the type of development specified in the Town's Official Plan for Erin and Hillsburgh.

Table D4 - Erin Town Core 2, flow summary

Development Type	Number of Lots	Lot Area (Ha)	ADF Estimate (m ³ /d)	Peak Flow Estimate (m ³ /d)
Residential	157	18.7	154.4	601.1
Commercial	3	0.95	26.6	98.4
Institutional	1	0.94	20.9	83
Residential – Intensification (5%)	8 ¹	-	7.8	27
Residential - Infill	6	-	6.0	23.7
Total	175	20.6	215.7	833.2

¹ Equivalent lots.

1.4 South East Erin

The area designated as South East Erin is a primarily residential area with limited commercial properties and covers the properties in Erin along 9th Line south of Wellington 124 Rd. There are 191 lots in this area, 186 of which are single residence lots, 2 commercial lots, as well as a farm, and a cemetery. The total average day flow estimate for the area is 186.3 m³/d, shown in Table D5.

In addition to the established development, a few acres of land in this area have been identified for future growth. Maps have been provided in **Appendix B** showing the location of the growth areas and the type of development specified in the Town's Official Plan for Erin and Hillsburgh.

Table D5 – South East Erin, Flow Summary

Development Type	Number of Lots	Lot Area (Ha)	ADF Estimate (m ³ /d)	Peak Flow Estimate (m ³ /d)
Residential	186	50.0	186.3	721.1
Commercial	2	0.4	11.2	43.7
Residential - Infill	11	-	10.9	36
Total	199	50.4	208.4	800.8

1.5 South Erin

The area designated as South Erin is a residential area with a larger average lot size than the surrounding community. There are 176 lots in this area, primarily along Wellington Road 124. The total average day flow estimate for the area is 173.9 m³/d, shown in Table D6.

In addition to the established development, a few acres of land in this area have been identified for future growth. Maps have been provided in **Appendix B** showing the location of the growth areas and the type of development specified in the Town's Official Plan for Erin and Hillsburgh.

Table D6 – South Erin, flow summary

Development Type	Number of Lots	Lot Area (Ha)	ADF Estimate (m ³ /d)	Peak Flow Estimate (m ³ /d)
Residential	176	97.6	173.9	694.5
Residential – Growth	118	7.4	126	378
Total	294	105	299.9	1,072.5

1.6 North East Erin

The area designated as North East Erin is a residential area with a larger average lot size than the surrounding community. There are 91 lots in this area, primarily along Credit River Road and Pine Ridge Road. The total average day flow estimate for the area is 89.9 m³/d, shown in Table D7.

In addition to the established development, a large plot of land in this area has been identified for future growth. Maps have been provided in **Appendix B** showing the location of the growth areas and the type of development specified in the Town's Official Plan for Erin and Hillsburgh.

Table D7 – North East Erin, flow summary

Development Type	Number of Lots	Lot Area (Ha)	ADF Estimate (m ³ /d)	Peak Flow Estimate (m ³ /d)
Residential	91	44.1	89.9	370.5
Residential – Growth	288	18	306.4	919.3
Total	379	62.1	396.3	1,289.8

1.7 Erin Heights

The Erin Heights area is a residential subdivision which is separated from the downtown by the West Credit River. There are 114 lots within the area, all of which are single residence properties. The total average day flow estimate for the area is 112.6 m³/d, shown in Table D8.

Two large sections of land have been identified for potential future growth in this area. Maps have been provided in **Appendix B** showing the location of the growth areas and the type of development specified in the Town's Official Plan for Erin and Hillsburgh.

Table D8 – Erin Heights, flow summary

Development Type	Number of Lots	Lot Area (Ha)	ADF Estimate (m ³ /d)	Peak Flow Estimate (m ³ /d)
Residential	114	17.7	112.6	451.5
Residential - Growth	896	56	953.3	2,860
Total	1,010	73.7	1,065.9	3,311.5

1.8 Overland Drive

The Overland Drive area is a residential subdivision which is separated from the downtown by a small body of water. There are 98 lots within the area, all of which are single residence properties. The total

average day flow estimate for the area is 96.8 m³/d, shown in Table D9. There is no GIS data for the properties in this location so the total lot area is unknown.

Table D9 – Overland Drive, flow summary

Development Type	Number of Lots	Lot Area (Ha)	ADF Estimate (m ³ /d)	Peak Flow Estimate (m ³ /d)
Residential	98	-	96.8	397.7

1.9 Erin Summary

Table D10 – Summary of Erin Decision Area Flows

Decision Area	Equivalent Population [Build-out]	Existing ADF Estimate (m ³ /d)	Build-out ADF Estimate (m ³ /d)
Industrial Area	1,653 [4,655]	628	1,765.4
Erin Town Core 1	1,891 [1,891]	718.7	718.7
Erin Town Core 2	568 [568]	215.7	215.7
South East Erin	548 [548]	208.4	208.4
South Erin	458 [789]	173.9	299.9
North East Erin	237 [1,042]	89.9	396.3
Erin Heights	296 [2,805]	112.6	1,065.9
Overland Drive	255 [255]	96.8	96.8
Total	5,906 [12,554]	2,244	4,767.1

Appendix - E

Hillsburgh Wastewater Flow Detail

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1.0 Hillsburgh Wastewater Flow

1.1 Hillsburgh Town Core 1 and 2

The areas designated as Hillsburgh Town Core 1 and 2 comprise the majority of the village and are primarily residential development, however this area also has the majority of the commercial properties in the town. In total, these areas are bounded at the north end by Howe St., Trafalgar road on the west and on the south end by Douglas Cres. The area has 356 individual lots, including 11 commercial properties. Based on the Town's GIS database the combined area of the commercial properties is approximately 1.4 Ha. Using the MOECC standard, an estimated 39.2 m³/d of average day sewage flow would be generated from the commercial portion of this area. The remaining lots (residential units) combine for an average day flow of 369.57 m³/d, shown in Table E1.

In addition to the established development, a significant amount of land in this area has been identified for future growth. Maps have been provided in **Appendix B** showing the location of the growth areas and the type of development specified in the Town's Official Plan for Erin and Hillsburgh.

Table E1 – Hillsburgh Town Core 1 and 2, flow summary

Development Type	Number of Lots	Lot Area (Ha)	ADF Estimate (m ³ /d)	Peak Day Estimate (m ³ /d)
Residential	344	56.4	367.2	1,469
Commercial	11	1.4	39.2	155.6
Residential – Infill	10	-	9.9	32.7
Residential – Growth	720	45	766	2,298
Total	1,085	102.8	1,182.3	3,955.3

1.2 George Street

George Street is a short residential street on the south side of Trafalgar Road. In total, there are 27 properties, 26 residential properties, and 1 commercial property. Based on the Town's GIS database the area of the commercial property is approximately 0.3 Ha. Using the MOECC standard, an estimated 2.8 m³/d of average day sewage flow would be generated from the commercial property in this area. The remaining lots (residential units) combine for an average day flow of 25.7 m³/d.

In addition to the established development, a significant amount of land in this area has been identified for future growth. Maps have been provided in **Appendix B** showing the location of the growth areas and the type of development specified in the Town's Official Plan for Erin and Hillsburgh.

Table E2 – George Street, flow summary

Development Type	Number of Lots	Lot Area (Ha)	ADF Estimate (m ³ /d)	Peak Day Estimate (m ³ /d)
Residential	26	2.3	25.7	101.6
Commercial	1	0.3	8.4	33.2
Total	27	2.6	34.1	134.8

1.3 South Trafalgar Road

The South Trafalgar Road area has a total of 74 lots and includes the village's local public school. The residential lots in this area combine for an average day flow of 92.4 m³/d. A summary of the sewage generation for the area is provided in Table E3.

There is a significant amount of land that has been allocated for future growth in this area. Maps have been provided in **Appendix B** showing the location of the growth areas and the type of development specified in the Town's Official Plan for Erin and Hillsburgh.

Table E3 – South Trafalgar Road, flow summary

Development Type	Number of Lots	Lot Area (Ha)	ADF Estimate (m ³ /d)	Peak Day Estimate (m ³ /d)
Residential	73	74.8	75.1	286.9
Institutional	1	2.3	11.4	46.8
Residential – Intensification (20%)	-	-	14.4	50.5
Residential – Growth	896	56	973.1	2,860
Industrial - Growth	-	7.7	69.3	207.9
Total	970	141	1,143.3	3,452.1

1.4 Upper Canada Drive

The Upper Canada Drive area has a total of 46 residential lots. Through the Septic System Survey this area has been selected for exclusion from the ultimate sanitary system. The residential lots in this area combine for an average day flow of 45.4 m³/d. A summary of the sewage generation for the area is provided in Table E4.

Table E4 – Upper Canada Drive, flow summary

Development Type	Number of Lots	Lot Area (Ha)	ADF Estimate (m ³ /d)	Peak Day Estimate (m ³ /d)
Residential	46	12.9	45.4	191.9

1.5 Hillsburgh Summary

Table E5 – Summary of Hillsburgh Decision Area Flows

Decision Area	Equivalent Population [Build-out]	Existing ADF Estimate (m ³ /d)	Build-out ADF Estimate (m ³ /d)
Hillsburgh Town Core 1 & 2	1,140 [3,111]	433.4	1,182.3
George Street	90 [90]	34.1	34.1
South Trafalgar Road	228 [3,009]	86.5	1,143.3
Upper Canada Drive	119 [119]	45.4	45.4
Total	1,577 [6,329]	599.4	2,405.1