



## MEMORANDUM

TO: Gary Eitel  
City Administrator  
Rogers, Minnesota

FROM: Scott A. Lange, PE  
City Engineer

DATE: August 22, 2006

RE: 2006 Southeast Hassan Township Planning  
*Wastewater Treatment Plant Flows*  
Rogers, MN  
SEH No. A-ROGER 0623 14

This memorandum summarizes results of our study of the wastewater flows for the Rogers Wastewater Treatment Plan (WWTP) and the capacity of the plant to accept additional flows.

### **Background**

The 2010 orderly annexation area has provided additional land with the potential for development. Additionally, Hassan Township is exploring the development of 600+ acres of land in the southeast part of the Township. Hassan Township is scheduled to receive access to Metro Sewer through the Elm Creek Interceptor in approximately 2009 with a capacity of 870,000 gallons per day.

The purpose of this analysis is to determine correct flows at the Rogers WWTP, the capacity for additional development service, and if there is availability to provide the southeast portion of Hassan Township with sewer service on a temporary or permanent basis.

### **Existing Conditions**

The Rogers WWTP capacity treats about 0.8 MGD (Million Gallons per Day) monthly. There have been peak months where the flow has been about 1.0 MGD. The current wet weather plant capacity is 1.602 MGD.

The wastewater collection and treatment systems were analyzed by determining the wastewater flows generated from the area inside the 2010 boundary. We collected existing flows for the developed properties and assigned future flows for undeveloped property within the 2010 boundary. The attached Exhibit A details existing developed lots, planned developments, and future residential and commercial flows. Also included is a chart of the flow timelines, and a map of areas included in the analysis.

We also compared the methods used to calculate the flow from the Southeast Hassan area provided by Hassan Township and the method we used for the City of Rogers flows, which by comparison were very similar (Exhibit B).

### Analysis of WWTP

Currently, the facility treats about 0.8 MGD, with peaks of 1.0 MGD in the wet season. The following is a summary of the City of Rogers treatment needs:

Existing flow to the plant (1.0 MGD wet season)	0.8 MGD
New flow for existing Rogers and 2010 annexation areas	1.2 MGD
Miscellaneous redevelopment of commercial areas	<u>0.1 MGD</u>
Total needed flow (2.3 MGD if I & I is not removed)	2.1 MGD
Existing plant capacity (wet weather)	<u>1.6 MGD</u>
Additional capacity needed (0.7 MGD with I&I)	0.5 MGD

Included is a chart of the flow timelines and map of areas included in the analysis. We also calculated the timeframe in which the capacity will be needed. We used two scenarios. One using a defined development rate, and two allowing a unconstrained development rate. See methodology and results in the attached Exhibit C. The additional capacity will be needed at about 2013 for unconstrained growth, 2015-2017 for constrained growth, depending on the level of Inflow and Infiltration (I&I) reduction.

### Analysis of Sanitary Sewer Collection System Interceptor Line

In order to provide service to southeast Hassan, the collection system was analyzed to verify the capacity.

Two interceptor sanitary sewer lines were analyzed herein called Interceptor A and B for potential connections to southeast Hassan Township. Computer software was used in determining pipe capacities and modules using Sewer Cad from Haestad Methods. Due to the scope of this review, the following assumptions were made:

- mains are at minimum grade
- invert elevations were assumed
- calibration tests were not performed
- the main is in free of debris and in working condition.

All of these items need to be included in the analysis before any connection to the City collection system.

### Interceptor A (CSAH 81) (SDLR)

The existing sanitary sewer interceptor line includes 8- to 12-inch sewer mains and extends from the WWTP to the east side of Fletcher Hills development as shown in Exhibit D.

The sanitary sewer flows were entered into the system at various connection points. Using a peaking factor of 3.5, the interceptor can handle an additional 500 units or 132,000 gal/day without additional upgrade. The pipes at John Deere Lane and Main Street (Pipe 25 – 36) is the restriction point.

Interceptor B

Another route considered was taking the flow north to the 12-inch sanitary line near Cabela's, then north along Wilfred Lane to the 15inch line in South Diamond Lake Road. This route, at the fully developed state, loads the sanitary lines to a point that the B option does not seem to be viable for additional flows from the south.

**Summary**

In summary, the Rogers WWTP will need to be upgraded at some point to fully develop the entire 2010 annexation area. However, there may be some opportunity to provide sewer service temporarily to the southeast Hassan area prior to service being provided in the Elm Creek interceptor.

The collection system has the capacity to take some additional flows from the southeast Hassan area without any major upgrade on a temporary basis. The final route and capacity will need to be determined with some more detailed analysis as the project moves forward.

djg

Enclosures      Exhibit A – Map With Service Areas  
                         Exhibit B – Projected Flows  
                         Exhibit C – Projected Flow Chart  
                         Exhibit D – Sewer Collection System

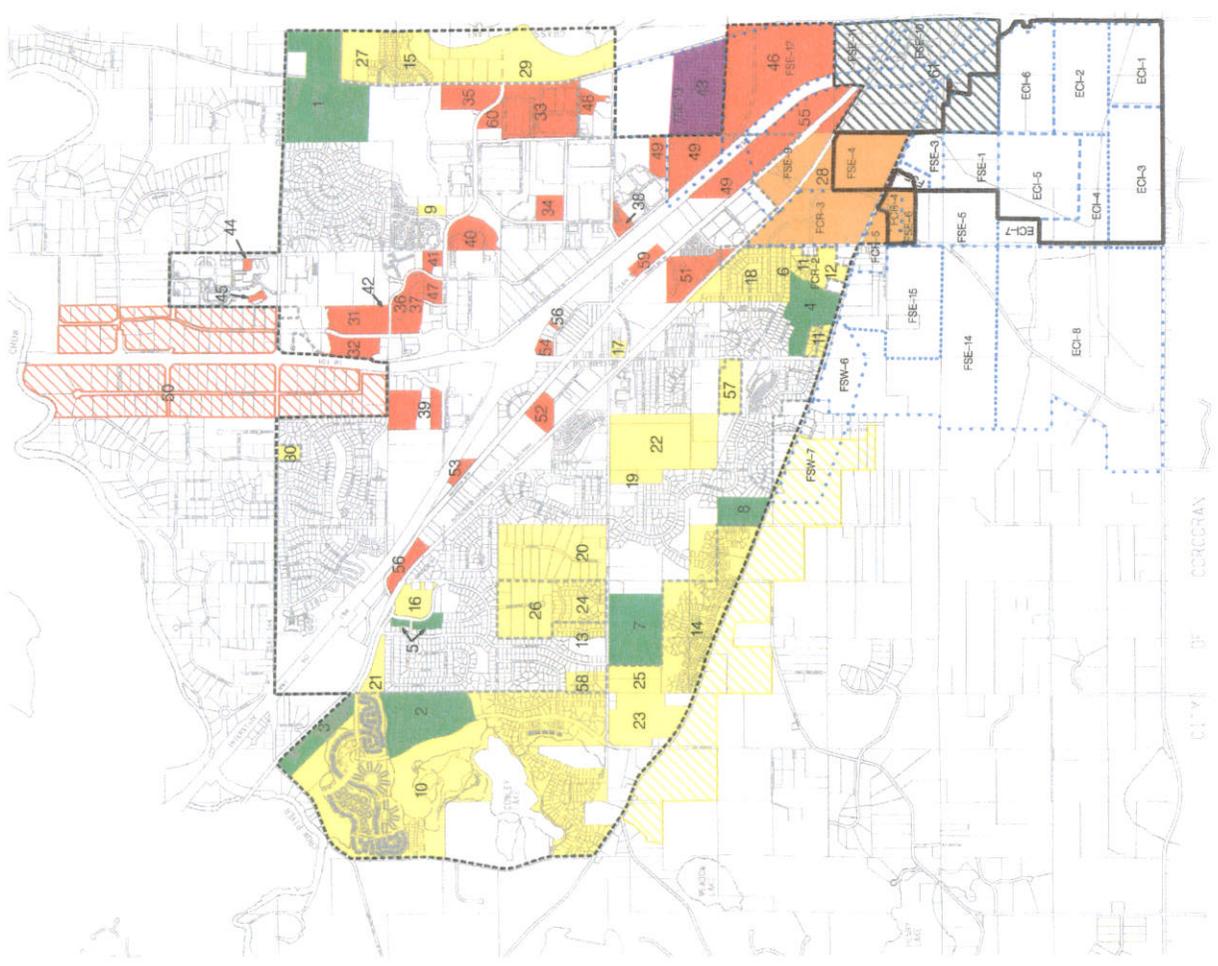
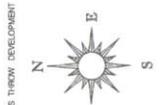
c: John Seifert, City of Rogers (w/enclosures)  
Gary Eitel, City of Rogers (w/enclosures)  
Randy Jenniges, SEH (w/enclosures)

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- RESIDENTIAL EX. LOTS
- RESIDENTIAL PLANNED/FUTURE
- RESIDENTIAL / COMMERCIAL FUTURE
- COMMERCIAL/INDUSTRIAL
- COMMERCIAL / INSTITUTIONAL
- JOINT POWERS
- FUTURE JOINT POWERS
- URBAN RESERVE

1. BROOKTON MEADOWS PHASE 1 AND 2
2. VALKS AT WATERS EDGE
3. FLETCHER HILLS PHASE 1
4. FOX CREEK NORTH
5. KING ISLANDS
6. TERRITORIAL VIEW 2ND ADDITION
7. WELLSHEAD 4TH
8. EDGEWATER PHASE 2-4
9. FLETCHER HILLS 2
10. FLETCHER HILLS 1
11. MYSTIC HOOK
12. WEEBENHAMP (MAYLET)
13. PALTE PROPERTY
14. BROOKTON DEVELOPMENT
15. BROOKTON PROPERTY
16. GREENHILL PROPERTY
17. ARTHUR STREET
18. WEST WINDHAM
19. GAMBOL PROPERTY
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FUTURE DEVELOPMENT	
FCR-1	FCR-2
FCR-3	FCR-4
FCR-5	FCR-6
FCR-7	FCR-8
FCR-9	FCR-10
FCR-11	FCR-12
FCR-13	FCR-14
FCR-15	FCR-16
FCR-17	FCR-18
FCR-19	FCR-20
FCR-21	FCR-22
FCR-23	FCR-24
FCR-25	FCR-26
FCR-27	FCR-28
FCR-29	FCR-30
FCR-31	FCR-32
FCR-33	FCR-34
FCR-35	FCR-36
FCR-37	FCR-38
FCR-39	FCR-40
FCR-41	FCR-42
FCR-43	FCR-44
FCR-45	FCR-46
FCR-47	FCR-48
FCR-49	FCR-50
FCR-51	FCR-52
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FCR-95	FCR-96
FCR-97	FCR-98
FCR-99	FCR-100



SANITARY SEWER SERVICE AREA  
ROGERS, MINNESOTA



Sanitary Sewer Flow Generation  
 Rogers, MN  
 A-ROGER 0623

08/22/06

**EXHIBIT B  
 PROJECTED FLOWS**

**Existing Lots**

	Development Name	Lots Available		Single Family (274 gpd/HH)	Multi-Family (220/HH)	Subtotal	Year	Buildout
		Single Family	Multi-Family					
1	Brockton Meadows 1st and 2nd	118	64	32,332	14,080	46,412	2006-2009	4
2	Edgewater (phase 1)	165	48	45,210	10,560	55,770	2006-2009	4
3	Villas @ Watersedge	0	76	0	16,720	16,720	2006-2009	4
4	Fletcher Hills (phase 1)	76	0	20,824	0	20,824	2006-2009	4
5	Fox Creek North	16	0	4,384	0	4,384	2007	1
6	King Estates	18	0	4,932	0	4,932	2006-2007	2
7	Reimer Addition	79	46	21,646	10,120	31,766	2006-2009	4
8	Territorial View 2nd Addition	25	0	6,850	0	6,850	2007-2009	3
	<b>Total</b>	<b>497</b>	<b>234</b>	<b>136,178</b>	<b>51,480</b>	<b>187,658</b>		

**Planned Developments**

	Development Name	Lots Available		Single Family (274 gpd/HH)	Multi-Family (220/HH)	Subtotal	Year	Buildout
		Single Family	Multi-Family					
10	Edgewater (phase 2-4)	404	552	110,696	121,440	232,136	2008-1012	5
11	Fletcher Hills (phase 2)	25	0	6,850	0	6,850	2007-2009	3
12	Villas @ Fletcher Hills	0	34	0	7,480	7,480	2007-2009	3
13	Mystic Ridge	23	0	6,302	0	6,302	2007-2009	3
14	Weber/Knapp (Manley)	212	0	58,088	0	58,088	2009-2012	4
15	Pulte	70	0	19,180	0	19,180	2008-2012	4
	<b>Total</b>	<b>734</b>	<b>586</b>	<b>201,116</b>	<b>128,920</b>	<b>330,036</b>		

**Future Residential Areas - Served**

	Development Name	Planned		Single Family (274 gpd/HH)	Multi-Family (220/HH)	Subtotal	Year	Buildout
		Single Family	Multi-Family					
9	Wellstead 4th	0	40	0	8,800	8,800	2008-2010	3
16	Busch Property	0	40	0	8,800	8,800	2010-2011	2
17	Downtown Redevelopment	0	55	0	12,100	12,100	2012-2013	2
18	Erickson Property	77	60	21,098	13,200	34,298	2012-2013	2
19	Greeninger Property	11	0	3,014	0	3,014	2010	1
20	Arthur Street	20	0	5,480	0	5,480	2015	1
21	Veit Property	0	30	0	6,600	6,600	2016	1
22	Weber/Kinghorn	133	0	36,442	0	36,442	2012-2013	2
23	Gmach Property	86	0	23,564	0	23,564	2010-2011	2
24	Gould Property	58	0	15,892	0	15,892	2010-2011	2
25	Sunderland Property	40	0	10,960	0	10,960	2010-2011	2
26	Basswood	12	0	3,288	0	3,288	2015	1
27	Pohlig Property	37	0	10,138	0	10,138	2016	1
28	Fletcher Area Development	0	10.6	0	2,332	2,332	2010-2011	2
29	Grass Lake Area Development	105	50	28,770	11,000	39,770	2012-2013	2
30	Weber	0	15	0	3,300	3,300	2015	1
FSE-4	In Annexation Area		261	0	57,420	57,420	2012-2013	2
FSE-6	In Annexation Area	36		9,864	0	9,864	2016	1
FCR-4	In Annexation Area	32	4	8,768	880	9,648	2017	1
FCR-5	Half In Annexation Area	24	6	6,576	1,320	7,896	2018	1
	<b>Total</b>	<b>671</b>	<b>571.6</b>	<b>183,854</b>	<b>125,752</b>	<b>309,606</b>		

**Future Institutional Areas**

	Development Name	Planned		Subtotal	Year	Buildout
		Single Family	Multi-Family			
43	Lutheran High School	500	20gal/student	10,000	2012-2013	2

**EXHIBIT B  
 PROJECTED FLOWS**

**Commercial Developments**

Development Name	Acreage	Square Feet Bld	SAC (7,000sf) Office (2,400sf)	WH Flows	Year	Buildout
31 Lowes	15.9	155,836	33	9,023	2006	1
32 Cub	12.9	126,433	27	7,320	2006	1
33 Moen & Leur	53	519,453	110	30,076	2008	1
34 Roger Industrial Park (Vangaard)	2.2	21,562	5	1,248	2007	1
35 Roger Industrial Park (Brockton Meadows)	17.1	167,597	35	9,704	2009	1
36 Muller Theater	12	117,612	25	6,810	2006	1
37 Medical Building	3	29,403	6	1,702	2008	1
38 Cabelas Restaurant	1.6	15,682	3	908	2006	1
39 WJD II	20	196,020	41	11,349	2008	1
40 Reinhart	18.7	183,279	39	10,612	2006	1
41 Hampton Inn	4.7	46,065	10	2,667	2006	1
42 Hynes Development	5.4	52,925	11	3,064	2008	1
44 High School Expansion	500 students	20gal/student		10,000	2008	1
45 Ice Arena	1.6	600 seats		4,000	2007	1
46 Kinghorn Industrial/Commercial Park	2.8	27,443	6	1,589	2009	1
47 Dehn Family	6.5	63,707	13	3,689	2008	1
48 Rogers Ind. Park 6th	6	58,806	12	3,405	2009	1
49 Vevea Area	32.7	320,493	68	18,556	2009	1
50 Th 101 Corridor	300	600gal/acre		180,000	2014-2020	7
51 Church/Erickson	24.3	238,164	50	13,789	2015	1
52 Southside Lumber Redevelopment	9.4	92,129	19	5,334	2015	1
53 94 West Business Park	4.3	42,144	9	2,440	2015	1
54 Hotel/Conference Center	3.3	32,343	7	1,873	2015	1
CSAH 81/I-94 Commercial						
FSE-9 In Annexation Area	100	980,002	207	56,741	2012-2015	4
FSE-12 In Annexation Area	33	326,667	69	18,914	2012-2013	2
FCR-3 In Annexation Area	68	668,722	141	38,718	2012-2013	2
<b>Total</b>	<b>459</b>			<b>453,531</b>		

**HASSAN TOWNSHIP**

	Planned Units		Township Method			City Method			
	Residential	Single Family	Multi-Family	Single Family (274 gpd/HH)	Multi-Family (274/HH)	Subtotal	Single Family (274 gpd/HH)	Multi-Family (220/HH)	Subtotal
ECl-1			318	0	87,132	60,992	0	69960	87,132
ECl-3		188		51,512	0	51,512	51512	0	51,512
ECl-4			0	0	0	0	0	0	0
ECl-5			264	0	72,336	72,336	0	58080	72,336
ECl-7		15	4	4,110	1,096	5,027	4110	880	5,206
ECl-8		541	135	148,234	36,990	177,749	148234	29700	185,224
FSE-1		103	0	28,222	0	28,222	28222	0	28,222
FSE-2			183	0	50,142	50,142	0	40260	50,142
FSE-3		43		11,782	0	11,782	11782	0	11,782
FSE-5		65	21	23,290	5,754	29,091	23290	4620	29,044
FSE-7		25	6	6,850	1,644	8,598	6850	1320	8,494
FSE-8		38	9	10,412	2,466	12,453	10412	1980	12,878
FSE-14		284	71	77,816	19,454	97,128	77816	15620	97,270
FSE-15		209	52	57,266	14,248	71,752	57266	11440	71,514
FSW-6		89	22	24,386	6,028	29,142	24386	4840	30,414
FSW-7		91	23	24,934	6,302	29,821	24934	5060	31,236
<b>Total</b>						<b>735,747</b>			<b>772,406</b>

	Township Method			City Method				
	Commercial	Acreage	Square Feet Bld	Subtotal	Acreage	Square Feet Bld	SAC WH (7,000sf)	Flow
ECl-2		43.57	531,415	43,576	78.31	767516	182	44,438
ECl-6		52.43	639,478	52,437	73.91	724392	153	41,941
FCR-5		8.29	101,111	4,704	8.29	81250	17	4,704
FSE-8		7.82	95,379	7,757	13.67	133980	28	7,757
FSE-10		32.70	398,835	32,704	40.22	394196	83	22,823
FSE-11		22.17	270,403	22,173	30.56	299519	63	17,342
FSE-13		60.39	736,565	60,398	149	1460349	309	84,552
<b>Total</b>				<b>223,750</b>				<b>223,559</b>

	Township	Rogers
Total Served Flow	1,280,831	1,280,831
Misc. Commercial	100,000	100,000
Total Unserved Flow	10,000	10,000
Hassan Township	959,496	995,965
<b>Total</b>	<b>2,350,327</b>	<b>2,386,796</b>

**EXHIBIT B**  
**PROJECTED FLOWS**

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Estimated buildout rate for development projects per year (non-sewered not included)

<u>Year</u>	<u>Flow</u>
2006	82,678
2007	64,132
2008	166,069
2009	153,965
2010	102,466
2011	96,518
2012	193,965
2013	133,016
2014	39,900
2015	75,404
2016	52,316
2017	35,362
2018	33,610
2019	25,714
2020	25,714
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	1,280,831

SAC determination

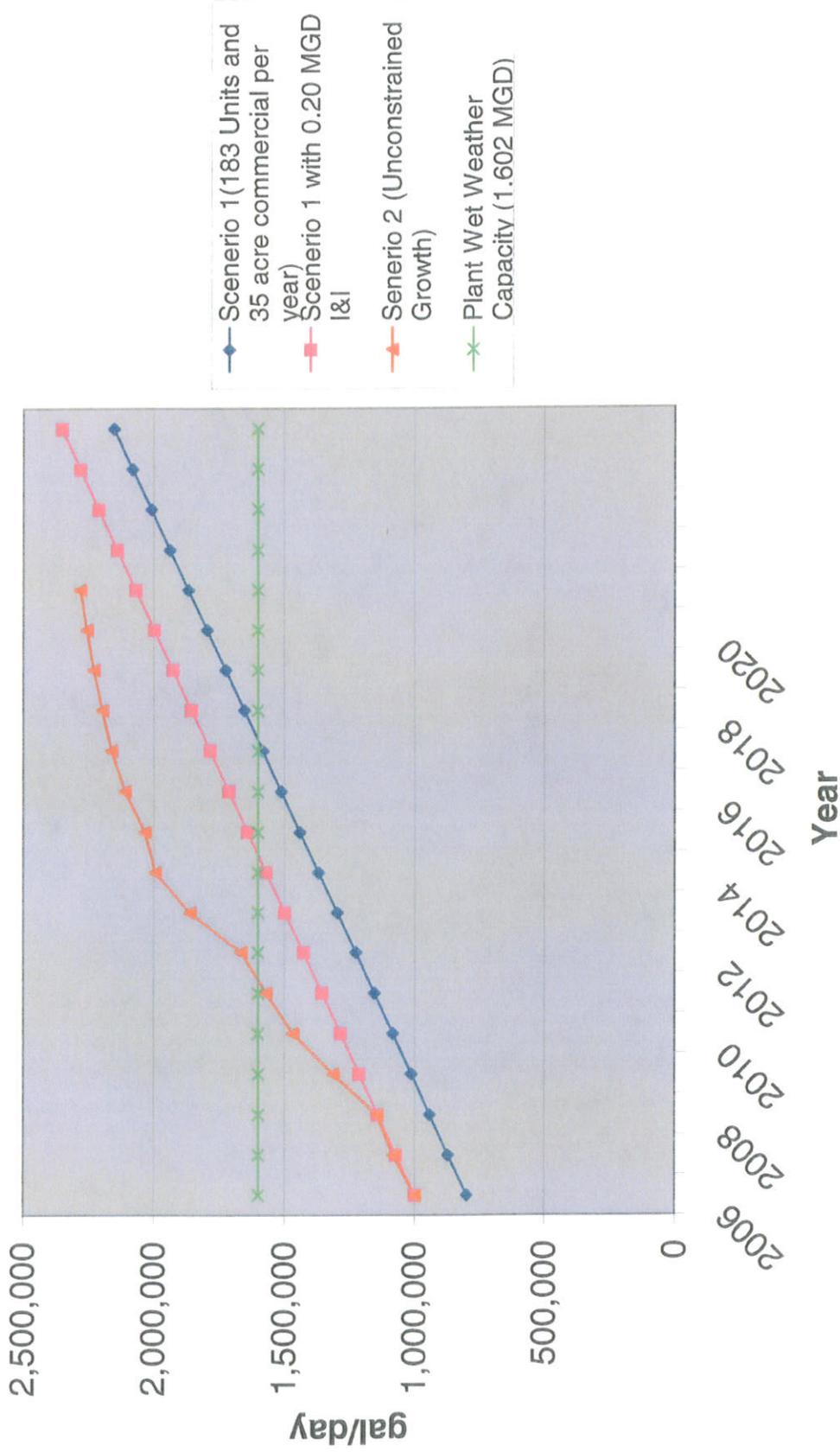
85% Impervious - 30% Building - 75/25  
75 - Warehouse 1 SAC/7,000 SF  
25 - Office 1 SAC/2,000SF

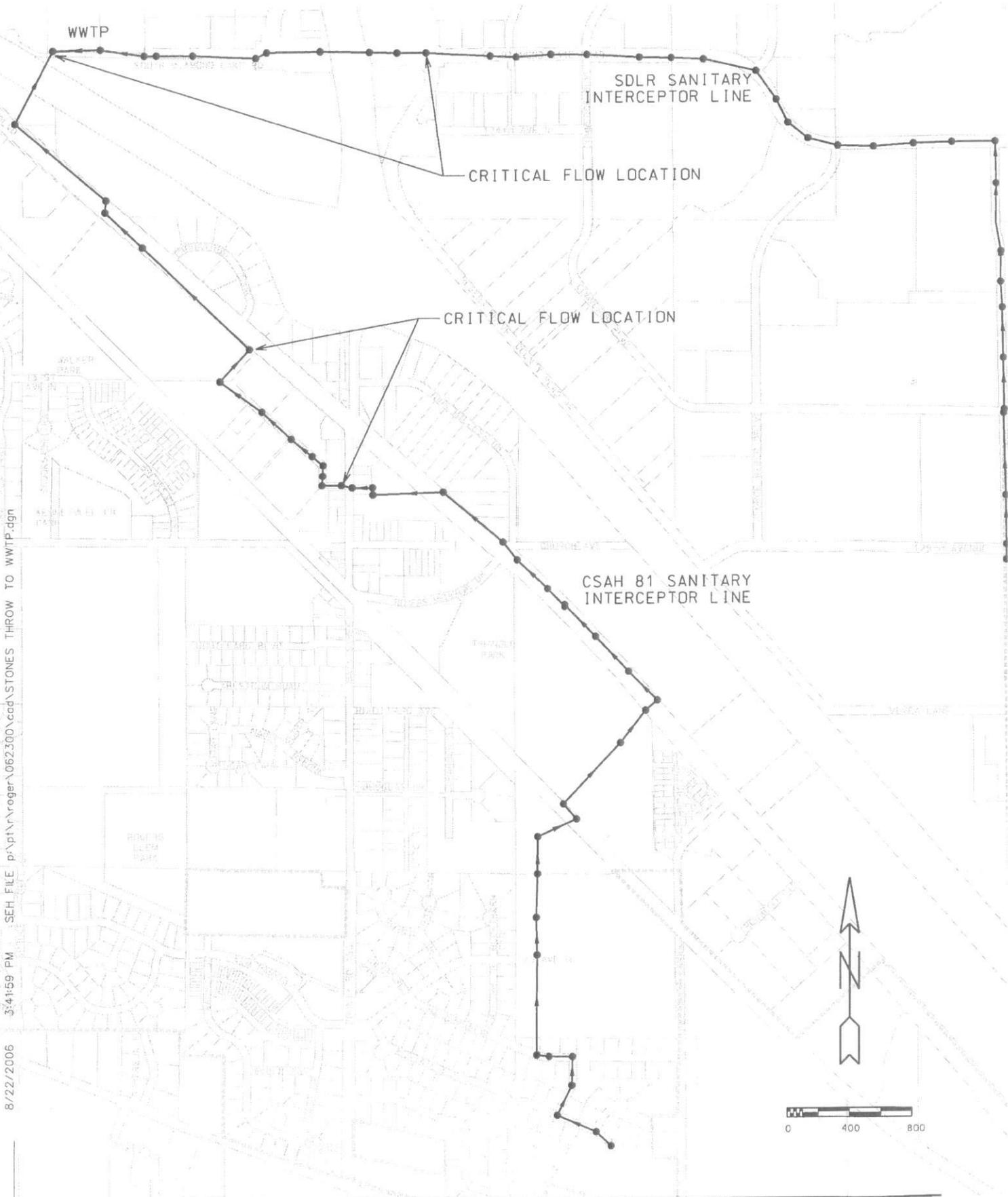
Notes:

Metro flow numbers for Hassan Township are based on "StonesThrowConceptSewerFlows-JcJ\_Rev3\_8-9-06.xls" From Metro LS &CE

Rogers flow numbers for Hassan Township are based on the "StonesThrowConceptSewerFlows-JcJ\_Rev3\_8-9-06.xls" for the following:  
Residential flow numbers from concept layouts of Stone Throw development projected units times 274 gallons  
Commercial flow numbers calculated from total land per area times the met council calculation.

# Exhibit C Projected WWTP Flows





8/22/2006 3:41:59 PM SEH FILE p:\p\N\roger\062300\cad\stones throw to wwtp.dgn



EXISTING SANITARY SEWER  
 INTERCEPTOR LINES  
 ROGERS, MINNESOTA