City of Lake Elmo

3800 Laverne Avenue North
Lake Elmo, Minnesota 55042

(651) 777-5510 Fax: (651) 777-9615
Www.LakeElmo.Org

NOTICE OF MEETING

The City of Lake Elmo
Planning Commission will conduct a meeting on
Monday, July 26, 2010, at 7:00 p.m.

AGENDA

1. Pledge of Allegiance
2. Approve Agenda
3. Approve Minutes
    a. None.
4. Public Hearings
    a. None
5. Business Items
    a. Comprehensive Plan – Urban (Sewered) Area Density Analysis Discussion.
    b. County SSTS Ordinance (Subsurface Sewage Treatment System Regulations) Discussion.
6. Updates (Verbal)
    a. City Council;
        i. July 13, 2010 Workshop: Village Area Planning, Home Occupation Ordinance, and Senior Living/Farm School Development
        ii. July 20, 2010 Meeting: Administrative Fine Ordinance, Home Occupation Ordinance, Senior Living/Farm School Development
    b. Staff Updates
    c. Commission Concerns
7. Adjourn

Planning Commission
Date: 7/26/10
Business Item
Item: 5a

ITEM: Comprehensive Plan – Urban (Sewered) Area Density Analysis Discussion

REQUESTED BY: Planning Department

SUBMITTED BY: Kelli Matzek, City Planner

REVIEWED BY: Danielle Bailey, Planning Intern

SUMMARY AND ACTION REQUESTED:

The Planning Commission is being asked to review the housing and employment projections from the Lake Elmo Comprehensive Plan and to specifically discuss the analysis and resulting figures as they relate to the City's future sewered development areas. Staff has attempted to analyze the land areas available for development, the housing and employment counts required, and the corresponding densities for the two areas in the city guided for future sewered development – the Village Area and South of 10th Street. Staff found a few discrepancies and conflicting data in utilizing various guiding documents and therefore, some assumptions were made in the attached analysis. The attached charts and maps contain a significant amount of information that will be more thoroughly discussed at the Planning Commission meeting on July 26th.

REVIEW OF COMP PLAN PROJECTIONS AND ANALYSIS:

I-94 to 10th Street

One of the attached charts developed by Staff provides information on the acres available for both residential and non-residential development for the future sewered areas South of 10th Street. This analysis found that almost 50 acres of land guided for residential development is in a floodplain and is unbuildable. However, staff also found that a parcel guided for Public Facilities may be more aptly developed for sewered residential housing and would therefore accommodate the loss of land to floodplains. Staff found the inclusion of this parcel and resulting calculation to be close to that identified in the Comprehensive Plan.

The same chart analyzes the proposed future sewered non-residential development in the I-94 corridor. Staff found the numbers to be lower than that identified in the Comprehensive Plan – however, the number of sewered employees (the unit used in the land use chapter of the Comp Plan) is inclusive of both the I-94 corridor and the Village Area and is identified as "Total Sew. Employees." Further study is needed by staff to evaluate the employment calculations in the Village Area to ensure this requirement could be met.

Staff has some concern with meeting the employment requirements as outlined in the Memorandum of Understanding (MOU). The density requirement for employment in the I-94 corridor is 40 employees per acre for both the area guided as Business Park and Limited

Business. This high density may be difficult to achieve as the idea of a corporate campus at the corner of Manning and I-94 may no longer be supported by the market. As a real world example, staff provided a map showing some examples in the Lake Elmo Eagle Point Business Park development of the number of employees per acre. This may help to visualize what 40 employees per acre may look like in the future.

Village Area
As mentioned earlier in this report, staff is providing a chart showing some draft numbers of the employment calculations in the Village Area. Staff will need additional time to further refine and analyze the numbers as there are some significant assumptions made when converting from Residential Equivalent Units (REC) to employees.

Additionally, a chart is provided with an analysis of the future residential development of the Village Area. The majority of the discrepancies in the guiding documents (2006 Comprehensive Plan, Village Area Master Plan, Village Area AUAR, and a letter dated 12-3-07 from the previous City Attorney) is in the interpretation of the number of future residential housing units that are required. Staff will go through some of the discrepancies during the meeting, but the focus of the discussion should not be on the discrepancies, but instead how the city would like to move forward.

As discussed during the rural density discussion in June, the overestimate of the current housing in the Village also creates some imprecise calculations and adds to the discrepancies mentioned above. A study conducted in 2007 showed that there were 194 housing units within the Village area, which is 306 less (500 assumed) than would hook up to the regional sewer in 2030 according to the Comprehensive Plan.

The problem with attempting to adjust the numbers used in the Comprehensive Plan is that the 306 Village units either need to be added to the unsewered development areas or the sewered development areas in order for the overall housing unit and population projections to reach the respective targets of 8,727 and 24,000 set in the Comprehensive Plan.

Penalties
In addition, the Comprehensive Plan does state there are penalties to the city if certain development does not occur at the assigned timetable. Staff has been working with the Metropolitan Council to receive an extension to the table, but the wording in this chapter may need to be revised due to the downturn in the market as well.

ADDITIONAL INFORMATION:

- Given the complex nature of this information, Staff is planning to take time with the Planning Commission to review and discuss attached charts and maps at the July 26th meeting.

STAFF RECOMMENDATION:

The Planning Commission is not being asked to take any specific action at this time. Staff is seeking feedback concerning the methodology used to achieve the scenarios described above, and any additional comments regarding the Comprehensive Plan's household and employment projections.

ORDER OF BUSINESS:

- Introduction ..... Kyle Klatt, Planning Director
- Report by staff ..... Kelli Matzek, City Planner
- Discussion by the Commission ..... Chair & Commission Members

ATTACHMENTS:

1. I-94 Area Analysis Chart
2. Future Land Use Map
3. Existing Eagle Point Business Park Map
4. Village Area Residential Analysis Chart
5. Ltr. Attorney Filla 12-3-07
6. Comprehensive Plan Village Area Future Land Use Map
7. Village Area Employee Analysis Chart
8. Village Area ½ Mile Radius Map
9. Memorandum of Understanding (MOU)
10. Excerpts from 2006 Lake Elmo Comprehensive Plan
11. Excerpts from Lake Elmo Village Area AUAR
12. Village Area Master Plan Map

I-94 Area Analysis - Future Sewered Residential and Non-Residential

Land Analysis - Residential

Residential Buildable Area Calculation		Acres
Total Land Area Guided for SRD3.5[1]		1,110.82
(as guided in the Land Use Map)	Floodplains	49.1
	Partially guided properties	35.87
Potentially buildable area guided for SRD3.5		1,025.85

Land Analysis - Residential	Acres	Density	Capacity
Future Sewered Residential (S of 10th)	1,025.85	3.5	3,590
Existing R-3 (Cimarron)	228.83[2]		500[3]

Comprehensive Plan Requirements	Acres	Density	Capacity	Difference
Land Guided SRD3.5 (pg III-7)	1,069	3.5	3,741.50	151
Households - Other Sewered (pg III-17)			3,600	10

(Cimarron is a separate line item in the chart and is not included in this number.)

[1]Includes 14 acre parcel guided PF unintentionally

[2]Including floodplain and PF guided properties

Acreages calculated by staff, densities from Comp Plan used

Land Analysis - Non-Residential	Acres	Density	Capacity	Difference
Future LB (Future sewer - 40 Employees/Acre)	16.1	40 empl.	644	
Future BP (Future sewer - 40 Employees/Acre)	241	40 empl.	9640	
SUMMARY	257.1		10,284	

Acreages calculated by staff, densities from Comp Plan used

LB Future Sewer	16	40 empl.	640	-4
BP - Sewered (pg III-7)	241	40 empl.	9,640	
Existing BP (sewered)	121		1,000[3]	
SUMMARY	378		11,280	

Acreages and densities used from Comp Plan

Total Sewered Employees (pg III-17)			13,000
New Sewered Employees (MOU)			13,000

(The sewered employee counts calculated here do not include Village Area Employees, therefore the numbers do not match calculations above.)

[3]As identified in the Comp Plan

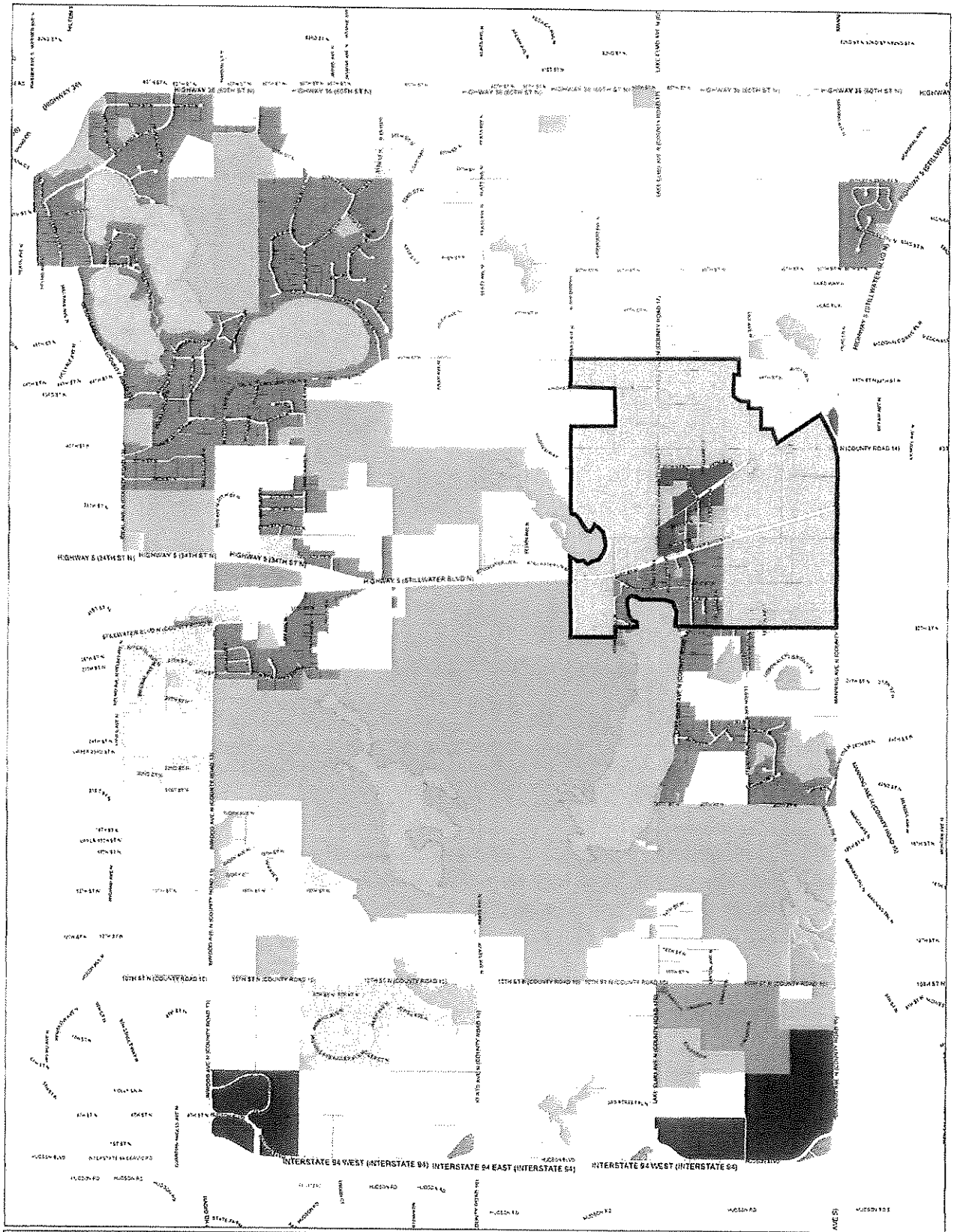
Acreages and densities calculated in Comp Plan

SRD3.5 - Sewered Residential Development 3.5 unit Density

LB - Limited Business

BP - Business Park

The residential and non-residential analysis for the I-94 area was done utilizing information from the 2006 Comprehensive Plan, the Village Area AUAR and the Village Area Master Plan. Some conflicting data was found among the sources and assumptions were made by staff in the creation of this document.



FUTURE LAND USE

Lake Elmo Comprehensive Plan 2005 - 2030

Limitation of Liability

This document is not a legally recorded map or survey and is not intended to be used as one. This map is a compilation of records and information from various state, county, and city offices, and other sources

Map Date: January 31, 2006

Created By: TKDA

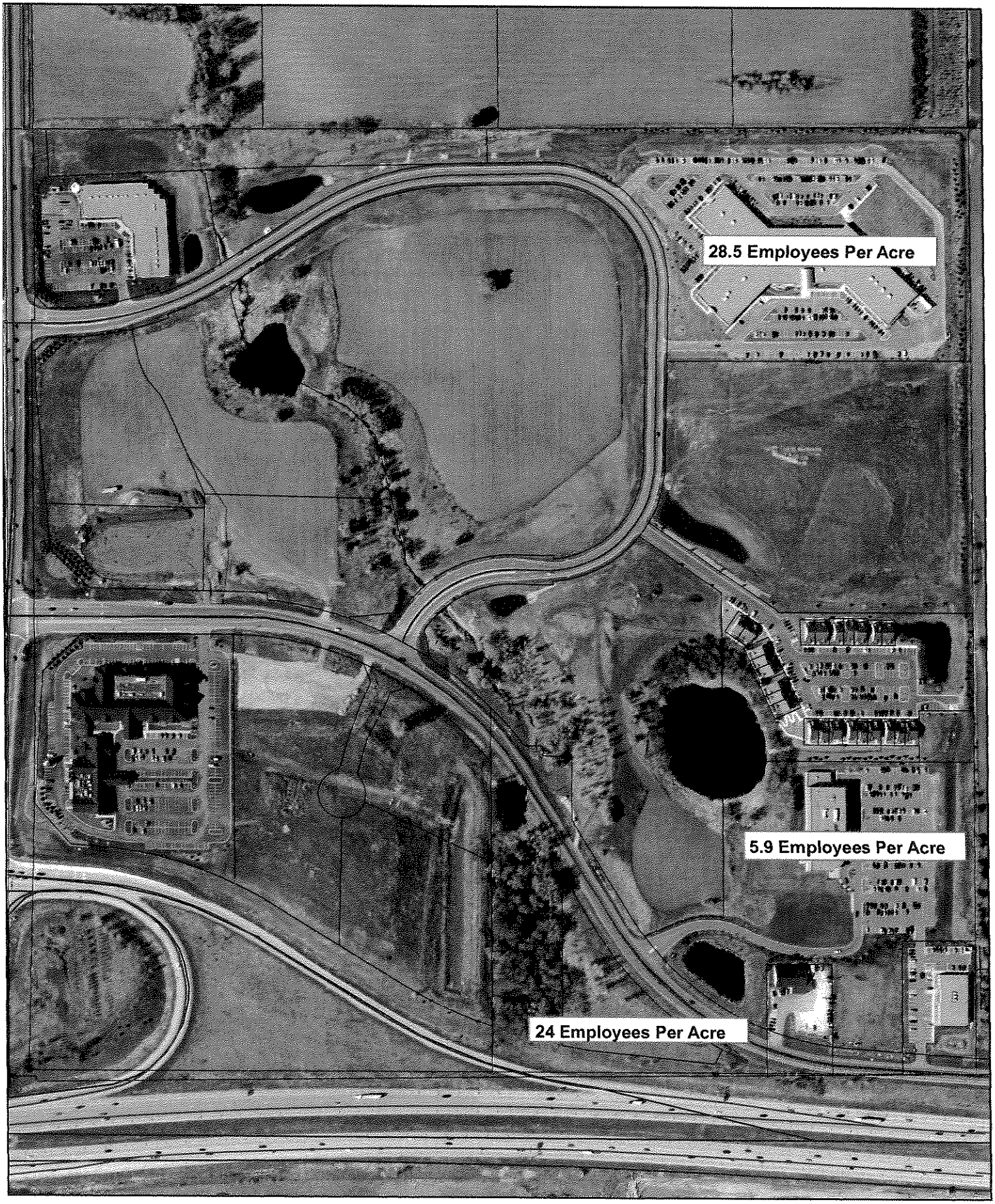
0 600 1,200 2,400 3,600

Feet

Land Use

- C
- BP - 40 Employees/Acre
- PF
- RAD - 0.45 DU/Acre
- RAD - 2 DU/Acre
- URD - Cimarron
- SRD - 3.5 DU/Acre
- LB Future sewer - 40 Employees/Acre
- LB Non-sewer
- RED
- NC
- ROW
- WAT
- VR

Existing Eagle Point Business Park



Village Area Residential Analysis

Village Master Plan

AUAR Information on Village Area Land Uses

	Acres
Existing Old Village City Fabric	154.2
Open Water	62
Existing R-O-W	84
Potential Future Redevelopment (Existing Dev. Parcels)	44.5
New Mixed Use Dev.	73
New Civic/Institutional	16.5
New Residential Dev.	308.6
Buffer Zone, New & Existing Parks, Horse Farm, Existing Old Village City Fabric (Open Space)	532.2
	1274.5

Village Area Master Plan Designation

Lot Type	Acres	Density	Units	Range Provided (Table)
Large & Medium	223.4	1.5 - 2.5	335 - 558 (avg. 446.5)	411 - 625 (avg. 518)
Large	5.3	1.5	8	10 - 15 (avg. 12.5)
Medium	7.2	2.5	18	12 - 15 (avg. 13.5)
Townhouse	34.7	8	278	258 - 342 (avg. 300)
Twinhome	21.2	5	106	45 - 60 (avg. 52.5)
Apt/Condo	50.5	[5.5]		280
Housing over Retail	43.6	[0.6 - 0.9]		25 - 40 (avg. 32.5)
Small SF	14.5	4	58	77 - 100 (avg. 88.5)
SUMMARY	400.4	3.1	1227	1298

The residential analysis for the Village Area was done utilizing information from the 2006 Comprehensive Plan, the Village Area AUAR, the Village Area Master Plan, and a letter written by former City Attorney Jerome Filla dated December 3, 2007. Some conflicting data was found among the sources and assumptions were made by staff in the creation of this document.

Master Plan - Scenario: 600 Units

Lot Type	Acres	Density	Units
Large & Medium	223.4	0.98	218
Large	5.3	0.8	4
Medium	7.2	1.3	9
Townhouse	34.7	3.9	136
Twinhome	21.2	2.5	52
Apt/Condo	50.5	2.7	137
Housing over Retail	43.6	0.4	16
Small SF	14.5	1.9	28
SUMMARY	400.4	1.5	600

(Assumed uniform reduction in housing type)

Master Plan - Scenario: 1000 Units

Lot Type	Acres	Density	Units
Large & Medium	223.4	1.6	364
Large	5.3	1.3	7
Medium	7.2	2.1	15
Townhouse	34.7	6.5	227
Twinhome	21.2	4.1	86
Apt/Condo	50.5	4.5	228
Housing over Retail	43.6	0.6	26
Small SF	14.5	3.2	47
SUMMARY	400.4	2.5	1000

(Assumed uniform reduction in housing type)

Master Plan - Scenario: 1600 Units

Lot Type	Acres	Density	Units
Large & Medium	223.4	2.6	583
Large	5.3	1.9	10
Medium	7.2	3.2	23
Townhouse	34.7	10.5	363
Twinhome	21.2	6.5	138
Apt/Condo	50.5	7.2	365
Housing over Retail	43.6	1.0	42
Small SF	14.5	5.2	76
SUMMARY	400.4	4.0	1600

(Assumed uniform increase in housing type)

Comprehensive Plan Scenario

Comprehensive Plan - 906 Units (AUAR Analysis)

	Acres	Density	Units
VR/HD	7	14.6	102
VR/LD	77	4.4	339
VR MU/MD	45	10.3	465
SUMMARY	129	7.0	906

Comprehensive Plan Text (pg III-4 to 5)

	Acres	Density	Units
VR/HD	7	14.5	101*
VR/LD	77	3 - 4.4	231 - 339
VR MU/MD	45	5 - 6	225 - 270
SUMMARY	129	4.3 - 5.5	557 - 710

*Comprehensive Plan calls for up to 100 units)

Comprehensive Plan Attorney Analysis (see bottom left)

	Acres	Density	Units
VR/HD	7	14.5	101.5
VR/LD	77	0.45	34.65
VR MU/MD	86	5 - 6	430 - 516
VR P/S	43	0.45	19.5
VR G/B	717	0.45	322.65
SUMMARY	930	5.3 - 5.9	909 - 995

(**Average density was calculated using transfer of density as identified in the Comprehensive Plan text and therefore the entire land area was not used.)

VR/HD - Village Residential High Density
VR/LD - Village Residential Low Density
VR MU/MD - Village Residential Mixed Use/Medium Density
VR P/S - Village Residential Public and Semi-Public
VR G/B - Village Residential Green Belt

arren E. Peterson
ome P. Filla
niel Witt Fram
enn A. Bergman
an Michael Miller
chael T. Oberle
even H. Bruns*
ul W. Fahning*
nja R. Ortiz
ny K. L. Schmidt
n I. Rust
ed M. Goerlitz

PETERSON, FRAM & BERGMAN
PROFESSIONAL ASSOCIATION

Suite 800
55 East Fifth Street
St. Paul, MN 55101-1718
(651) 291-8955
(651) 228-1753 facsimile
www.pfb-pa.com

(651)290-6907
jfilla@pfb-pa.com

December 3, 2007

Mayor Dean Johnston and
Lake Elmo City Councilmembers
City of Lake Elmo
3800 Laverne Ave. North
Lake Elmo, MN 55042

Re: Sewered Housing Units
Old Village Area

Dear Mayor Johnston and Members of the City Council:

In 2004, the Minnesota Supreme Court determined that the Metropolitan Council had the statutory authority to require the City to modify its proposed Comprehensive Plan in the manner provided by Metropolitan Council Resolution No. 2003-10. This particular Metropolitan Council Resolution effectively incorporated a list of nine (9) required modifications, including a requirement that there would be development to accommodate 7,850 Residential Equivalent Units (REC's) of regional sewer capacity. All City Councilmembers opposed this level of development and asked the Metropolitan Council if it would be willing to negotiate some other solution. The negotiation resulted in the Memorandum of Understanding.

The Memorandum of Understanding was intended to provide guidance to the City as it began the task of revising the Comprehensive Plan draft that had been rejected by the Metropolitan Council. The Memorandum of Understanding mandates that the City achieve certain development goals by 2030 (Population-24,000; residential REC's- 5,200; and employment REC's-1,400), but it permits the City to use its discretion in determining how to achieve the 2030 development goals. The specific manner in which the City chose to exercise its discretion is reflected in the Comprehensive Plan that was approved by the City and by the Metropolitan Council, and in the official control which the City has and will adopt to implement the policies of the Comprehensive Plan.

In regard to the Old Village (both existing and new), the Comprehensive Plan identifies the number of sewered housing units in two (2) ways. First, it specifically states that there will be 1,100 sewered housing units in the Old Village by 2030 (Comprehensive Plan III-17). The City Engineer advises me there are 194 current

housing units in the Old Village. By subtracting current housing units from the projected housing units, the result is 906 new housing units.

Secondly, the Comprehensive Plan indirectly estimates the possible number of new housing units by adopting zoning categories for the Old Village (Comprehensive Plan III-3 through III-5); by specifying permissible densities within zoning categories for the Old Village (Comprehensive Plan III-3 through III-5); and by identifying the number of acres available for development within various zoning categories (Comprehensive Plan III-7).

Zone	Units/Acre	Acres	Max. Units
1. VR/HD	14.5	7	101.5
2. VR/LD	0.45	77	34.65
3. VR MU/MD	5-6	86	430-516
4. VR P/S	0.45	43	19.5
5. VR/GB	0.45	717	322.65

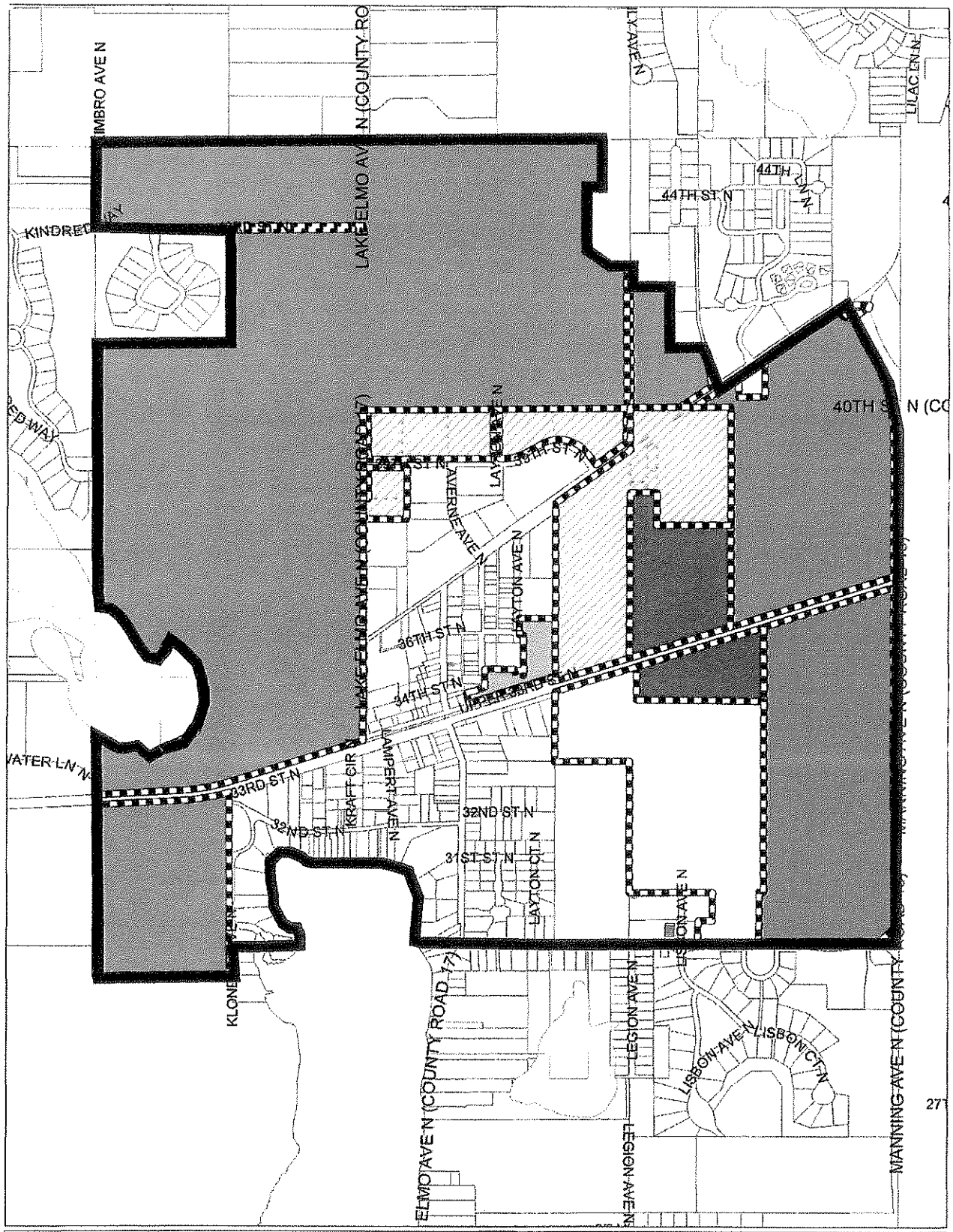
The above calculations indicate that there could be 909-995 new housing units to the Village area in addition to the existing 194.

If you have any questions please contact me.

Very truly yours,

/s/
Jerome P. Filla

JPF/jmt



PRELIMINARY VILLAGE AREA FUTURE LAND USE

Lake Elmo Comprehensive Plan 2005 - 2030

Limitation of Liability

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Map Date: January 31, 2006

Created By: TKDA

ENGINEERS PLANNERS SURVEYORS

0 200 400 800 1,200

Feet

Legend

Land Use

- VR-HD
- VR-MU/MD
- VR-LD
- VR-GB
- VR-P/S

Village Area Employment Analysis

Comprehensive Plan Requirements

MOU Requires	REC's	Capacity
Total	1,400 Employment RECs	14,000 Employees
New	1,300 Employment RECs	13,000 Employees
I-94 Analysis		
Total (Staff Projected)		11,280 Employees
New (Staff Projected)		10,284 Employees
Village Area		
Existing	171 Employment RECs**	1,710 Employees
Remaining		
Total New Required		13,000
Total New Projected - I-94		10,284
Total Existing (New Connection) in Village		1,710
Remaining Required		1006 Employees

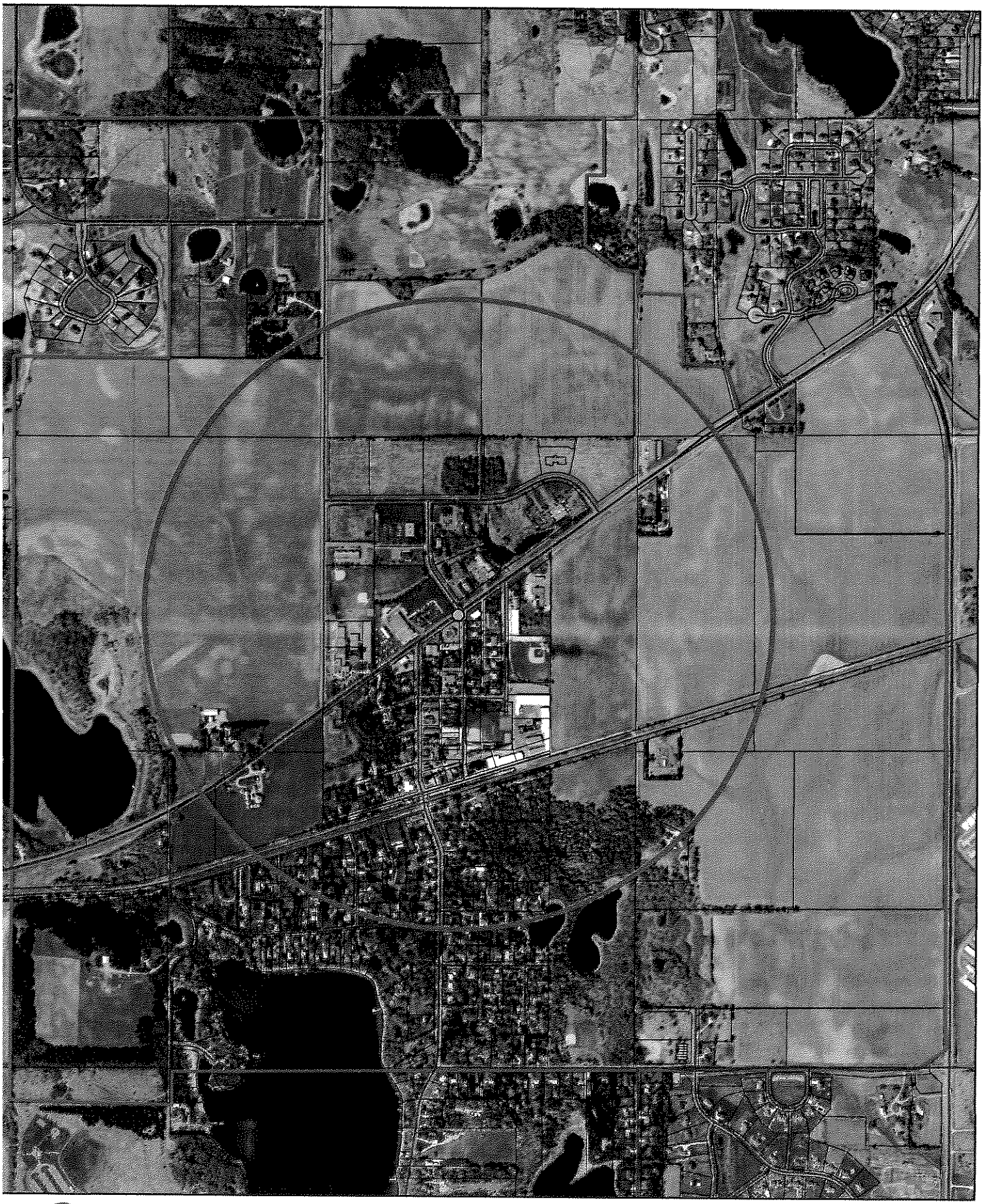
**This number was calculated by the Met Council standard of how to calculate REC's; staff converted to employees

New Non-Residential Development in Village Area			
	RECs	Density	Capacity
	100.6	10 Employees per Acre	1006 Employees

Village Master Plan Designation			
	Acres	Density	Capacity
Land Guided for New Commercial, Office, and Institutional	14.92	10 Employees Per Acre	1,492 Employees

The employment analysis for the Village Area was done utilizing information from the 2006 Comprehensive Plan, the Village Area AUAR and the Village Area Master Plan. Some conflicting data was found among the sources and assumptions were made by staff in the creation of this document.

Village Area



1/2 Mile Radius

Village Area Boundary

MEMORANDUM OF UNDERSTANDING
Lake Elmo / Metropolitan Council
Outline of criteria to be considered in preparation of City Comprehensive Plan

The following criteria were developed as the result of discussions among representatives of the City of Lake Elmo ("City") and the Metropolitan Council ("Council"). These criteria are intended to provide guidance to the City and to the Met Council as Lake Elmo modifies its local comprehensive plan to ensure conformity with metropolitan system plans as required by state law.

1. The City of Lake Elmo will commit to 6,500 new Residential Equivalent Units ("RECs") of Regional Sewer service by the year 2030. The City will commit to a city-wide population of 24,000 by the year 2030. Performance measures for this agreement will be total population and total utilized RECs in Lake Elmo.

   Note: The term "REC" shall be defined in Lake Elmo as one residential connection and/or the equivalent of 10 employees for new business operations.

2. The City will implement the population, employment, and RECs in the following manner.

Year	2000	2010	2020	2030
Population	6,863	*TBD*	*TBD*	24,000
Residential RECs	0	*TBD*	*TBD*	5,200
Employment RECs	100	*TBD*	*TBD*	1,400
Total RECs	100	*TBD*	*TBD*	6,600

3. The City will determine the types of housing and businesses to be developed and will meet or exceed an average residential density of 3 units per acre or a non-residential density of 40 employees per acre in urban (sewered) areas in the area south of 10th Street.

4. The City will plan for 1,300 new RECs (20% of 6,500) to be used for sewered employment.

5. The City will plan for Regional Sewer service to be provided in the southwest corner of Lake Elmo via the WONE Interceptor, and at Lake Elmo Avenue via the Cottage Grove Interceptor. Sewer capacity will be provided to meet the needs as specified in paragraph 2. It is anticipated at this time that design flows for the Regional Sewer service provided to the City will be made available as follows:

	RECs	**MGD**
To WONE Interceptor - Metro Plant (estimated construction completion: Dec. 2006)	1,825	0.50
To Cottage Grove Interceptor - Eagles Point Plant		
Phase I (estimated construction completion: Dec. 2007)	1,825	0.50
Phase II (estimated construction completion: Dec. 2010)	4,675	1.28
Total	8,325	2.28

6. The City of Lake Elmo will achieve a city-wide population of 24,000 by 2030. All population will be counted. Lake Elmo will use 6,600 RECs by 2030. All RECs used will be counted.

7. Should the City determine to extend Regional Sewer service to the existing Cimarron manufactured housing neighborhood (500 RECs), existing Old Village housing (up to 500 RECs), and/or new Old Village housing (up to 500 RECs), all utilized RECs shall be counted toward the expected community totals. Up to 1,000 RECs may be used in the Old Village area of Lake Elmo. It is understood that the average density of the aforementioned Old Village units shall be at least 3 units per acre.

8. The City will complete its required plan modifications by April 15, 2005 and submit its plan to adjacent communities for review by that time. This will allow time for the City to complete its local planning and review processes and submit its required plan modifications to the Council on for before June 15, 2005 and prior to the expiration of the nine-month plan modification period specified in state law.

9. The City's comprehensive plan shall be flexible enough to allow for possible limited post 2030 development, redevelopment, or environmental mitigation utilizing any Regional Sewer capacity (see paragraph 5) that may remain post 2030.

10. The signatories will present and recommend these guidelines to their respective governing bodies for consideration with the understanding that: (a) the adoption of a modified comprehensive plan ultimately is the responsibility of the full Lake Elmo City Council; and (b) the full governing body of the Metropolitan Council ultimately is responsible for reviewing the plan submitted by the City and determining whether the modified comprehensive plan conforms with metropolitan system plans.

On behalf of the City of Lake Elmo:

Dean A. Johnston, Mayor

Date: 2005-01-27

On behalf of the Metropolitan Council:

Peter Bell, Chair

Date: 1/27/05

1/27/2005 3:02 PM

Existing Land Uses	Land Use Descriptions	Area (Acres)
BP	Business Park	121
C	Commercial	114
LB	Limited Business	243
PF	Public/Semi-Public Facilities	3450
RAD	Rural Agricultural Density	7020
RED	Residential Estates Density	760
ROW	Right-of-Way	509
SRD	Single-family Residential Density	1709
URD	Urban Residential Density	169
WAT	Water	1155
TOTAL		**15250**

Future Land Uses	Total Area (Acres)	Village Area (Acres)	South of 10th (Acres)
BP	362		362
C	58	54	1
LB Future sewer	16		16
LB Non-sewer	45		
NC	1658	116	
PF	3381	23	122
RAD	5029		74
RAD2	142		
RED	691		153
ROW	545	45	161
SRD3.5	1069		1069
URD	169		169
WAT	1155		25
VR-HD	7	7	
VR-LD	77	77	
VR-MU/MD	86	86	
VR-P/S	43	43	
VR-GB	717	717	
TOTAL	**15,250**	**1,168**	**2,152**

Relationship to the Regional Development Framework

During the development, review and local adoption of this Land Use Plan the City Staff, Planning Commission, and City Council reflected repeatedly on the relationship of the Plan to the 2030 Regional Development Framework and the Metropolitan Council Draft 2030 Water Resources Management Plan. The details and amplifications of the 2005 Memorandum of Understanding (hereafter, "2005 MOU") have been incorporated in the Land Use Plan to the extent that such details and amplification modify or expand the Framework and/or Draft Water Resources Plan. MOU takes precedence where there is conflict with the Framework or Water Resources Plan.

1. The 2030 population and employment forecasts contained in Appendix A of the Metropolitan Council 2030 Development Framework – as adjusted in regard to forecasted persons-per-dwelling unit and the 2005 MOU.
2. The Regional wastewater flow targets for Lake Elmo from the Metropolitan Council Draft 2030 Water Resources Management Plan.
3. Paragraphs #2 and #5 of the City of Lake Elmo/Metropolitan Council 2005 MOU.
4. The City of Lake Elmo Community Facilities and Staffing Report – 2002

With respect to Regionally sewered growth, Paragraph #5 of the 2005 MOU details the planned Regional Wastewater capacities available to Lake Elmo as follows:

	REC	MGD
To WONE Interceptor - Metro Plant (estimated construction completion: Dec. 2006)	1,825	0.50
To Cottage Grove Interceptor - Eagles Point Plant		
Phase I (estimated construction completion: Dec. 2007)	1,825	0.50
Phase II (estimated construction completion: Dec. 2010)	4,675	1.28
Total	8,325	2.28

As required by the Metropolitan Council "Local Planning Handbook," the Lake Elmo Development Staging Plan, in 5 year increments, shall be as follows:

	2000	2005	2010	2015	2020	2025	2030
Total Households	2347	2750	3619	5114	6324	7524	8727
Households							
Old Village – Sewered	0	0	515	600	600	600	1100
Cimarron – Sewered	0	0	0	0	500	500	500
Other Sewered	0	0	0	1050	1900	2750	3600
Total Population	6863	7700	9952	14064	18403	21895	24000
Total Sew. Employees	1000	1000	1000	3800	5950	8800	13000
Total Employment	1636	1943	2250	5050	7200	10050	14000

The foregoing projections of sewered and unsewered dwelling units, population and employment shall be reviewed by the City at 5 year increments utilizing the data of the US Census Bureau for even year increments and the official estimates of the Metropolitan Council for odd year increments – when such data becomes available to the Public. If it is determined that the actual production of dwelling units, population and employment within the City is not equal to or greater than the foregoing projections, the City, with the cooperation and concurrence of the Metropolitan Council, will development measures to overcome any shortfalls during the ensuing 5 year period.

The City will adopt legal provisions to maintain this Staging Plan that may include a limitation on annual number of lots approved for platting, number of building permits issued, geographic extent of allowable development, or some combination of these or other suitable provisions. Such staging provisions shall provide for acceleration of the

Requirements for Areas Served by the Regional System

1. Community Forecast of Households and Employment for Areas Served by Regional Sewer Service (SAC Units)

Year	New Households				Employment		
	W. O. N. E	Cott Gr. Old Village	Cottage Grove S of 10th	Total	W. O. N. E	Cottage Grove	Total
2005	0	0	0	0	100	0	100
2006	0	125	0	125	152	0	152
2007	0	250	0	250	204	0	204
2008	0	320	0	320	256	0	256
2009	0	390	0	390	308	0	308
2010	0	460	0	460	360	0	360
2011	0	530	0	530	384	0	384
2012	280	600	0	880	408	0	408
2013	560	600	0	1160	432	0	432
2014	840	600	0	1440	456	0	456
2015	1120	600	0	1720	480	0	480
2016	1120	600	100	1820	480	64	544
2017	1120	600	270	1990	480	128	608
2018	1120	600	440	2160	480	192	672
2019	1120	600	610	2330	480	256	736
2020	1120	600	780	2500	480	320	800
2021	1120	600	950	2670	480	384	864
2022	1120	600	1120	2840	480	448	928
2023	1120	600	1290	3010	480	512	992
2024	1120	600	1460	3180	480	576	1056
2025	1120	600	1630	3350	480	640	1120
2030	1120	600	2480	4200	480	920	1400

2. Sanitary Sewer Plan Map.

The Staging Plan Map shows sewer service staging in 5 year increments and future land use.

the potential development opportunities associated with each land use category included in the composite land use map.

Table 6-1
Village Master Plan Composite Land Use Map – Potential Development Opportunities

Land Use Category	Acres	Potential Development Opportunities
Potential Future Redevelopment (Existing Developed Parcels)	44.5	Apartments/Condos, Neighborhood Retail, Housing Over Retail, Office
New Mixed Use Development	72.5	Apartments/Condos, Townhomes, and Small Lot Single Family. Commercial and Office Node (along TH 5 near 39th St.)
New Civic/Institutional Development	16.5	City Hall, Community Campus (family service center, library, wellness center, art center), New schools
New Residential Development	308.6	Variety of single family detached lot sizes, Townhomes
Existing Old Village City Fabric (Built Area)	154.2	Represents the portions of the Village that are not identified for future redevelopment
Buffer Zone/Open Space, New Parks/Open Space, Existing Parks/Open Space, Horse Farm, and Existing Old Village City Fabric (Open Space)	532.2	Active and passive recreational opportunities
Open Water	62.0	Active and passive recreational opportunities
Right of Way (existing)	84.0	Road maintenance and improvement projects

The only difference between the three scenarios based on the Village Master Plan is in the number of residential housing units (Scenarios A – 600 residential units, B – 1,000 residential units, and C – 1,600 residential units). All other development assumptions are the same between the scenarios (e.g., parks, open space, commercial, office, and institutional uses). A development scenario description is included in Table 6-2 and displayed on Figure 6-1.

Table 6-2
Village Master Plan Development Scenarios Description (Scenarios A, B, and C)

Composite Land Use Plan	Scenario A	Scenario B	Scenario C	Source:
Parks and Open Space (current and future)	47%	47%	47%	Village Master Plan prepared by Engstrom and Close Landscape Architects
Existing Village Built Area	14%	14%	14%	Village Master Plan
New Commercial/Institutional	7%	7%	7%	Village Master Plan
• New Commercial	300,000 ft^2	300,000 ft^2	300,000 ft^2	Close Landscape Architects
• New Office	150,000 ft^2	150,000 ft^2	150,000 ft^2	Close Landscape Architects
• New Institutional	200,000 ft^2	200,000 ft^2	200,000 ft^2	Close Landscape Architects
New residential	32%	32%	32%	Village Master Plan
• New Housing	600 units (B)	1,000 units (B)	1,600 units (B)	(A) Comp plan (B) Village Master Plan

COMPREHENSIVE PLAN – AUAR SCENARIO D

This future land use plan has been effectively replaced by the vision presented in the Village Master Plan for future development of the Village regardless of how many new housing units are part of the future development. Nevertheless, under the EQB's AUAR regulations, the city's comprehensive plan is a required scenario to be studied. The city attorney has determined the number of new housing units required in the comprehensive plan for the Village is 906 new units due to the number of actual existing housing units (Appendix D). This number is required to be used in evaluating the comprehensive plan impacts. However, the implementation of any new development scenario based on the Village Master Plan will require amending the comprehensive plan.

The city's adopted future land use plan is shown in Figure 6-2. This plan provides for low density housing located east of Reid Park between 30th Street and the railroad tracks, a high density residential area located at the former lumberyard site, medium density and mixed use centered along Stillwater Blvd (TH 5), public space east of the new residential areas, and a green belt surrounding the existing and proposed built portions of the village. Table 6-3 includes a more detailed description of Scenario D.

Table 6-3
Comprehensive Plan Scenario Description (Scenario D)

Village Future Land Use Designation	Acres	Housing Units	Commercial/Office (ft^2)	Institutional (ft^2)
Village Residential High Density (VR/HD)	7	102	-	-
Village Residential Low Density (VR/LD)	77	339	-	-
Village Residential Mixed Use/Medium Density (VR MU/MD)	45	465	450,000	
Village Residential Mixed Use/Medium Density (VR MU/MD)	41			
Village Residential Public/Semi Public (VR P/S)	43	-	-	200,000
Village Residential Green Belt (VR GB)	717	-	-	-
Open Water	62			
Right of Way	84			
No designation (existing Village Area)[2]	199	-	-	-
Total	**1,275**	**906**	**450,000**	**200,000**

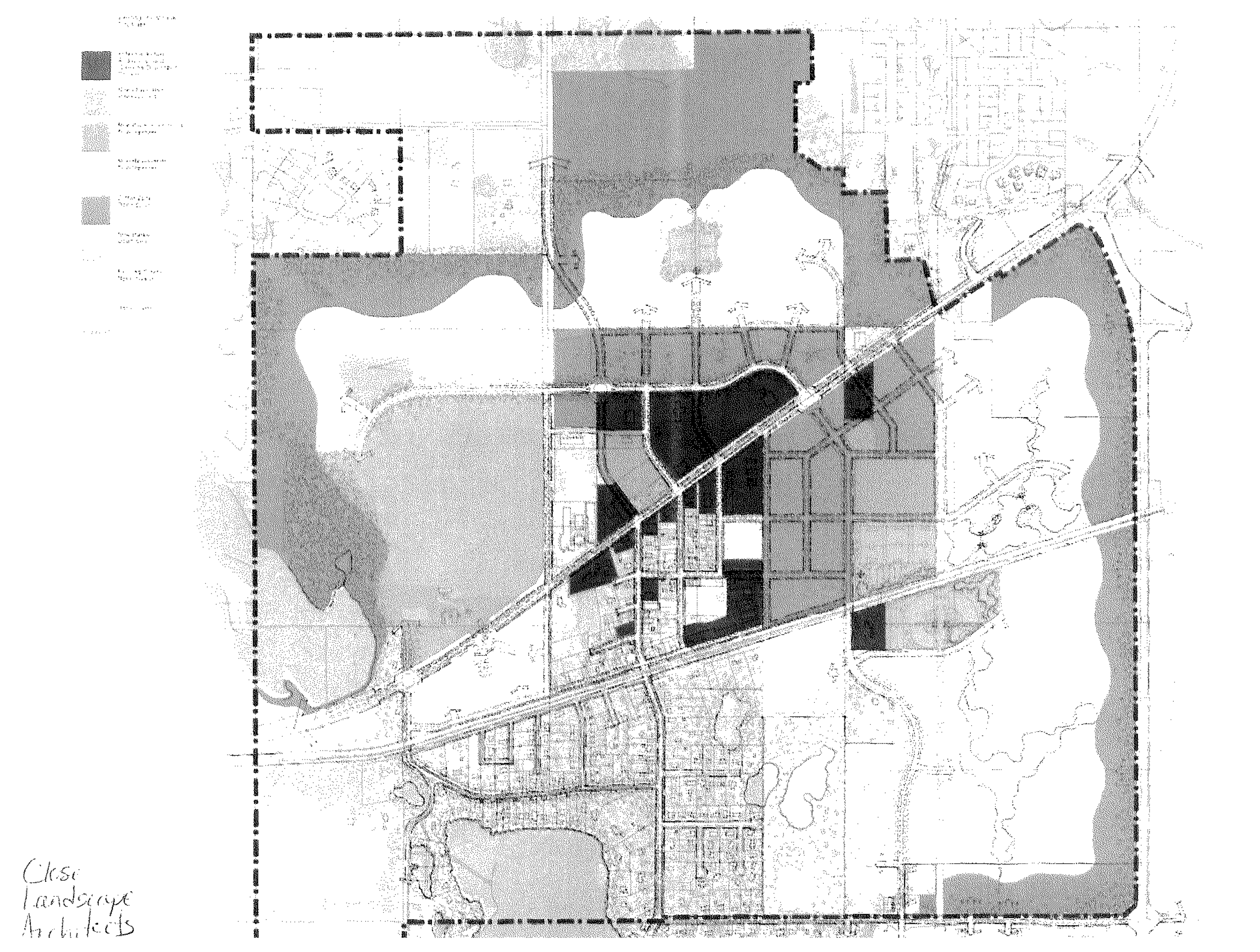
[1] Refers to the "white" areas on the Village Area Future Land Use Map

DEVELOPMENT SCENARIO COMPARISON

A comparison of the four development scenarios is provided in Table 6-4. The table provides a summary of the residential units, square feet of non-residential uses, and the percent of the Village that would accommodate the proposed uses.

Table 6-4
AUAR Development Scenario Comparison

Land Use Type	Scenario A	Scenario B	Scenario C	Sceanrio D
Parks and Open Space	47%	47%	47%	64%
New Residential	32%	32%	32%	11%
• New Housing	600 units	1,000 units	1,600 units	906 units
New Commercial/Institutional	7%	7%	7%	7%
• New Commercial	300,000 ft^2	300,000 ft^2	300,000 ft^2	300,000 ft^2
• New Office	150,000 ft^2	150,000 ft^2	150,000 ft^2	150,000 ft^2
• New Institutional	200,000 ft^2	200,000 ft^2	200,000 ft^2	200,000 ft^2
Existing Village Built Area	14%	14%	14%	18%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Landscape
Architects

Planning Commission
Date: 7/26/10
County SSTS Ordinance Discussion
Business Item
Item: 5b

ITEM: General Discussion Concerning County SSTS Ordinance (Subsurface Sewage Treatment System Regulations)

SUBMITTED BY: Kyle Klatt, Planning Director

REVIEWED BY: Kelli Matzek, City Administrator

SUMMARY AND ACTION REQUESTED:

The Planning Commission is being asked to receive an update from Staff concerning the recently adopted Subsurface Sewage Treatment System (SSTS) regulations adopted by Washington County. In accordance with Minnesota Rules, the City must adopt an ordinance that, at a minimum, is as strict as the new County ordinance within one year from the date of County approval. In this case, the City must either revise its regulations to either match or exceed the County's regulations by September 23, 2010 or will otherwise be required to abide by the County's ordinance.

BACKGROUND INFORMATION:

The City of Lake Elmo is unique in Washington County as it is one of only two communities that administers its own Individual Sewage Treatment Ordinance and does not rely on the County for these services. In addition, the City's current wastewater regulations would still include several standards that are more restrictive than the County. Staff is currently reviewing both the County's recently adopted Ordinance and the City's regulations, and will be providing a verbal update on some of the differences at the Planning Commission meeting. Some of the provisions that are more restrictive than the County's regulations include the following:

- Mound systems are not allowed as the first disposal site on any lot. The County's regulations permit this type of system as a primary system on a lot.

- The City requires sewage tanks shall be pumped or inspected by a city-licensed septic pumper, or inspected by a state-certified septic inspector every 2 years. The County ordinance specifies that these inspections can occur on a three-year cycle.

In addition, the City's regulations include provisions related to Community Sewage Treatment (201) Systems and Alternative Sewage Treatment (Wetland) Systems; a good portion of which deal with the administration of these systems, which is also somewhat unique amongst other communities in Washington County.

At this point in time, Staff is still reviewing the City's Ordinances and comparing them to the new County requirements. It appears that the most logical approach for the City will be to adopt the County ordinance by reference and either keep or eliminate those provisions that are more restrictive. Staff is seeking any initial feedback from Planning Commission in advance of preparing a formal ordinance revision for review at a future meeting. Staff will also be working to identify all of the regulations that the City has adopted that would remain more restrictive than the County's ordinance.

OTHER INFORAMTION:

Staff from Washington County will be making a presentation to the City Council on August 4, 2010 regarding the County SSTS Ordinance.

The City Code provisions that are applicable to this discussion include Chapter 51, Sections 51.001 – 51.007 and 51.045 – 51.066.

RECOMMENDATION:

Staff is recommending that the Planning Commission conduct a brief discussion on the issues described above and provide comments and suggestions that can be used to guide future work on the ordinance.

ATTACHMENTS:

1. Letter from Washington County Regarding SSTS Ordinance
2. Washington County Development Code, Chapter 4: SSTS Regulations

ORDER OF BUSINESS:

- Introduction and Presentation by Staff.....Kyle Klatt, Planning Director
- Questions from the Commission.....Chair & Commission Members
- Planning Commission Discussion.....Chair Facilitates

cc: council, Ryan, Dave

Washington County

Department of Public Health and Environment

Lowell Johnson
Director

Sue Hedlund
Deputy Director

May 10, 2010

City of Lake Elmo
C/O Susan Hoyt
3800 Laverne Avenue North
Lake Elmo MN 55042

COUNTY SSTS ORDINANCE

On September 8, 2009, the Washington County Board of Commissioners passed a resolution repealing the Washington County Development Code, Chapter Four, Individual Sewage Treatment System Regulations (Ordinance #128) and adopting the Washington County Development Code, Chapter Four, Subsurface Sewage Treatment System Regulations (Washington County Ordinance #179). The effective date of the ordinance is September 23, 2009.

Minnesota Rules, Chapter 7082.0050, Subpart 1, Paragraph B states:

> ***City and township ordinances must be adopted no more than 12 months after adoption of the county ordinance in which the city or township is located and must comply with the standards of chapter 7080 to 7083 and must be as strict as the applicable county ordinance.***

If CITY/TOWNSHIP NAME has a current septic system ordinance, it must be revised by no later than September 23, 2010 and be as strict as Washington County Ordinance #179. If CITY/TOWNSHIP does not currently have a septic system ordinance, you may either adopt an ordinance that is as strict as Washington County Ordinance #179, or adopt the Washington County Ordinance #179 by reference. After September 23, 2010, if a septic system ordinance adopted in CITY/TOWNSHIP NAME, has not been revised and/or adopted, the County's ordinance shall prevail.

As of this date, the Department has not been contacted regarding the status of the City's SSTS ordinance. The Department is committed to assisting communities with this ordinance revision. If your community would like assistance from the Department in any way, please contact Chris LeClair at 651-430-6673 or Pete Ganzel at 651-430-6676. Once the City's ordinance has been revised or adopted, please advise the Department as to the effective date of that revision.

The County Ordinance is posted on the Department's website at http://www.co.washington.mn.us/info_for_residents/environment/septic/ordinance_revision/ If the community is interested in receiving a bound version of Washington County Ordinance #179, please contact Stephanie Holt at 651-430-6678 and one will be mailed once they are published.

If you would have any questions or comments about the SSTS Ordinance, please contact Chris LeClair at 651-430-6673, Pete Ganzel at 651-430-6676, or me at 651-430-6744.

Sincerely,

Amanda Strommer

Amanda Strommer, Program Manager
Washington County Department of Public Health & Environment

CC: Chris LeClair, Sr. Environmental Specialist
Pete Ganzel, Sr. Environmental Specialist

WASHINGTON COUNTY

DEVELOPMENT CODE

Pursuant to MSA Ch 394, Washington County has adopted official controls for the purposes of regulating the physical development of land in the unincorporated areas of the County. These official controls are compiled into and hereafter known as the Washington County Development Code and consists of the following chapters each adopted by Ordinance.

(1)	Chapter One	Administration
(2)	Chapter Two	Zoning Regulations
(3)	Chapter Three	Subdivision Regulations
(4)	Chapter Four	Subsurface Sewage Treatment System Regulations
(5)	Chapter Five	Lower St. Croix River Bluffland and Shoreland Management Regulations
(6)	Chapter Six	Shoreland Management Regulations
(7)	Chapter Seven	Mining Regulations
(8)	Chapter Eight	201 Sewer Use Regulations
(9)	Chapter Nine	Flood Plain Regulations
(10)	Chapter Ten	Official Map Regulation and Designation

Summary
Washington County Development Code
Chapter Four Subsurface Sewage Treatment System Regulations
Ordinance No. 179

Individual sewage treatment systems, more commonly referred to as septic systems, have been regulated in Washington County since 1972. There have been numerous iterations of the ordinance regulating septic systems. In 1997 the Washington County Board of Commissioners adopted Ordinance No. 128, Individual Sewage Treatment System Regulations. Ordinance No. 128 is the County's current ordinance that regulates the location, design, installation, use and maintenance of individual sewage treatment systems. The regulations are Chapter Four of the Washington County Development Code and applies in all areas of Washington County, other than cities and towns that have adopted ordinances that complied with Minn. Stat. § 115.55 and the rules promulgated thereunder which were as strict as Ordinance No. 128.

On February 4, 2008, the Minnesota Pollution Control Agency published Minnesota Rules Chapter 7080 through 7083 governing Subsurface Sewage Treatment Systems (SSTS). Washington County is required to revise and implement an SSTS Ordinance which complies with the updated Minnesota Rules Chapters 7080, 7081, 7082, and 7083 by no later than February 4, 2010. On September 8, 2009, at its public hearing, the Washington County Board of Commissioners passed a resolution adopting Ordinance No. 179 which will repeal Ordinance No. 128. A brief summary of Chapter Four Subsurface Sewage Treatment Systems: Ordinance No. 179 is as follows:

Sections 1, 2, and 3 address the *Purpose and Intent* of the SSTS ordinance, provides expanded *Definitions* and describes how the Ordinance will be *Administered.* Section 4 establishes the *Compliance Criteria* for existing systems, new construction, and those systems receiving replacement components. Section 5 deals with *Acceptable and Prohibited Discharges* of those systems receiving sewage and those systems that receive both sewage and non sewage discharge.

Section 6 addresses *Permits*, the permitting process, and when permits are required for SSTS. Permit applications will now require management plans for the proposed system before a permit can be issued. Section 7 addresses *Operating Permits* and what must be included in the operating permits. Operating permits will be required for Type III systems, Type IV systems, Type V systems, all Midsized Sewage Treatment Systems, Holding tanks, SSTS serving Food Beverage and Lodging Establishments, and SSTS serving Hazardous Waste Generators. Operating permits include maintenance requirements, operational requirements, compliance limits and boundaries, reporting frequency, notification by permitted, identified reserve areas, and prohibited discharges.

Section 8 addresses when *Inspections* are required to determine compliance with Chapter Four. Compliance inspections must be conducted prior to issuance of a permit for the addition of a bedroom, all new construction and replacement, and prior to the transfer of any real property unless the age of the property's system is less than 5 years old. Compliance inspections are also required when deemed necessary by the Department. Section 8 further discusses Certificates of

Compliance and Certificates of Non-Compliance, as well as a process to resolve disputes over the depth of periodically saturated soil.

Section 9 addresses *Site Evaluation and Soil Testing* requirements for individual sewage treatment systems and Section 10 addresses additional *Site Evaluation and Soil Testing* requirements for midsized sewage treatment systems. Section 11 addresses *Groundwater Investigation* and Section 12 addresses *Sewage Flow Determination.* Section 13 deals with *Sewage Tanks* and the minimum number of required tanks. Section 14 addresses the *Distribution of Effluent*, non pressurized distribution pipes, gravity distribution, valve boxes, distribution boxes, and pressure distribution. Section 15 addresses the *Dosing of Effluent* and section 16 addresses *Treatment and Dispersal* with setback distances and soil hydraulic loading rates.

Section 17 addresses design standards for *Type I Systems*, which include trenches, pressure beds, mounds, and at grades. Section 18 addresses *Type II Systems*, which include systems in rapidly permeable soils, floodplain systems, holding tanks and privies. Section 19 addresses *Type III Systems*, which includes Graywater Systems. Section 20 addresses *Type IV Systems*, which are systems that employ registered product. Section 21 addresses *Type V Systems*, which are engineered systems.

Section 22 addresses *Maintenance* in accordance of the SSTS's operating management plan. Section 23 addresses *System Abandonment* and Section 24 addresses *Product Registration* in accordance of Minn. Rule 7083.4000 to 7083.4120. Section 25 addresses *Enforcement* of the Ordinance and Section 26 is for of the Ordinance's *Separability*. Section 27 addresses the *Effective Date* and publication of the Ordinance.

The forgoing is intended only as a summary of the Washington County Development Code Chapter Four - Subsurface Sewage Treatment System Regulations (SSTS) Ordinance No. 179. A printed copy of this Ordinance as well as a list of differences between this Ordinance, Ordinance No 128 and the Minnesota Rules Chapter 7080 is available at the Washington County Department of Public Health and Environment, the Washington County Auditor-Treasurer's office, and at the following website:
http://www.co.washington.mn.us/client_files/documents/phe/ENV/ENV-DraftSSTSRegs.pdf

WASHINGTON COUNTY DEVELOPMENT CODE

CHAPTER FOUR

SUBSURFACE SEWAGE TREATMENT SYSTEM REGULATIONS

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WASHINGTON COUNTY DEVELOPMENT CODE

CHAPTER FOUR

SUBSURFACE SEWAGE TREATMENT SYSTEM REGULATIONS

This chapter shall regulate the location, design, installation, use and maintenance of subsurface sewage treatment systems in all areas of Washington County other than cities and towns that have adopted ordinances that comply with Minnesota Statute 115.55 and are as strict as this Chapter. This chapter is authorized under Minnesota Statute Section 115.55 and 115.56 and Minnesota Statutes Chapter 145A.

SECTION 1. PURPOSE AND INTENT

1.1 This Chapter is adopted for the following purposes:

(1) To protect the public health, safety, and general welfare by the discharge of adequately treated sewage to the groundwater via the proper location, design, installation, use, and maintenance of individual subsurface sewage treatment systems (ISTS) and midsized subsurface sewage treatment systems (MSTS).

(2) These environmental protection standards shall be adopted county wide and administered and enforced by the Department or local units of government as directed by Minnesota Rules, Chapter 7082, and Minnesota Statute, Section 115.55.

(3) This chapter does not regulate systems that do not receive sewage as defined in this chapter. If systems receive both sewage and nonsewage, the requirements of this chapter apply, plus any additional requirements governing the nonsewage portion of the wastewater.

(4) To provide prescriptive design, construction, and operational standards to reasonably protect surface water and groundwater and promote public health, safety, and general welfare.

(5) To protect individual water supply wells of the community from contamination by inadequate, improperly designed, located, installed or maintained subsurface sewage treatment systems.

(6) To provide for the orderly development of areas of the community which are not served by central public wastewater treatment systems and to reduce the need to install central public wastewater treatment systems in areas where they are not now currently planned.

(7) Technology and products employed in system design shall adequately protect the public health and the environment as determined by Minnesota Rules, Chapter 7083, and be approved for use by the Department or local unit of government.

SECTION 2. DEFINITIONS

2.1 **Certain Terms**. For the purposes of this Chapter, certain terms or words used are interpreted as follows: the words "shall" and "must" are mandatory and the words "should" and "may" are permissive. All distances specified in this Chapter are horizontal distances unless otherwise specified.

2.2 For the purpose of this Chapter, the certain words and phrases are defined as follows:

(1) **Absorption area.** "Absorption area" means the parameter that is associated with the hydraulic acceptance of effluent. It is also commonly known as the infiltrative surface. The absorption area for a mound system is the original soil below a mound system that is designed to absorb sewage tank effluent. The absorption area for trenches, seepage beds, and at-grade systems is the soil area in contact with the part of the distribution medium that is designed and loaded to allow absorption of sewage tank effluent. This includes both bottom and sidewall soil contact areas.

(2) **Agency.** "Agency" means the Minnesota Pollution Control Agency (MPCA).

(3) **Alarm device.** "Alarm device" means a device that alerts a system operator or system owner of a component's status using a visual or audible device. An alarm device can be either on site or remotely located.

(4) **Applicable requirements.** "Applicable requirements" means:

A. This Chapter; Minnesota Rules, Chapter 7082; and, Minnesota Statutes, section 115.55; or

B. In areas of the County without complying ordinances to regulate SSTS, the requirements in this Chapter.

(5) **As-builts.** "As-builts" means drawings and documentation specifying the final in-place location, size, and type of all system components. These records identify the results of materials testing and describe the conditions during construction. An as-built also contains a certified statement.

(6) **ASTM.** "ASTM' means the American Society for Testing and Materials.

(7) **At-grade system.** "At-grade system" means a pressurized soil treatment and dispersal system where sewage tank effluent is dosed to an absorption bed that is constructed directly on original soil at the ground surface and covered by loamy soil materials.

(8) **Baffle.** "Baffle" means a device installed in a septic tank to retain solids and includes, but is not limited to, vented sanitary tees with submerged pipes and effluent screens.

(9) **Bedrock.** "Bedrock" means geologic layers, of which greater than 50 percent by volume consists of unweathered in-place consolidated rock or rock fragments. Bedrock also means weathered in-place rock which cannot be hand augered or penetrated with a knife blade in a soil pit.

(10) **Bedroom.** "Bedroom" means, for the sole purpose of estimating design flows from dwellings, an area that is:

A. a room designed or used for sleeping; or

B. a room or area of a dwelling that has a minimum floor area of 70 square feet with access gained from the living area or living area hallway. Architectural features that affect the use as a bedroom under this item may be considered in making the bedroom determination.

(11) **Biochemical oxygen demand or BOD.** "Biochemical oxygen demand" or "BOD" means the measure of the amount of oxygen required by bacteria while stabilizing, digesting, or treating biodegradable organic matter under aerobic conditions over a five-day incubation period, commonly expressed in milligrams per liter (mg/L).

(12) **Building.** "Building" means any structure used or intended for supporting or sheltering any use or occupancy.

(13) **Building sewer.** "Building sewer" means the part of the drainage system which extends from the end of the building drain and conveys its discharge to a subsurface sewage treatment system.

(14) **Carbonaceous biochemical oxygen demand or $CBOD_5$.** "Carbonaceous biochemical oxygen demand" or "$CBOD_5$" means the measure of the amount of oxygen required by bacteria while stabilizing, digesting, or treating organic matter under aerobic conditions over a five-day incubation period while in the presence of a chemical inhibitor to block nitrification. $CBOD_5$ is commonly expressed in milligrams per liter (mg/L).

(15) **Certificate of compliance.** "Certificate of compliance" means a document, written after a compliance inspection, certifying that a system is in compliance with applicable requirements at the time of the inspection.

(16) **Certified.** "Certified" means an individual is included on the Agency's SSTS certification list and is qualified to design, install, maintain, repair, pump, operate, or inspect an SSTS as appropriate with the individual's qualifications. A certified individual who is working under a license is subject to the obligations of the license. Certified individuals were previously known as registered professionals.

(17) **Certified statement.** "Certified statement" means a statement signed by a certified individual, apprentice, or qualified employee under Minnesota Rules, Chapter 7083 certifying that the licensed business or qualified employee completed the work in accordance with applicable requirements.

(18) **Cesspool.** "Cesspool" means an underground pit, receptacle, or seepage tank that receives sewage and leaches sewage into the surrounding soil, bedrock, or other soil materials. Cesspools include sewage tanks that were designed to be watertight, but subsequently leak below the designed operating depth.

(19) **Clean sand.** "Clean sand" means a soil fill material required to be used in mounds. The standards for clean sand are outlined in Section 17.3 (10).

(20) **Commissioner.** "Commissioner" means the commissioner of the Minnesota Pollution Control Agency.

(21) **Compliance inspection.** "Compliance inspection" means an evaluation, investigation, inspection, or other such process for the purpose of issuing a certificate of compliance or notice of noncompliance.

(22) **Contour Loading Rate.** "Contour Loading Rate" is the amount of effluent loaded to the soil per length of the dispersal unit or units along the single hillslope along the contour. The

contour loading rate is determined on the relationship between the vertical and horizontal water movement in soil and is based on the permeability difference between the absorption area and any deeper horizons, the depth between the absorption area and the change in permeability; and the land slope.

(23) **Department.** "Department" means the Washington County Department of Public Health and Environment.

(24) **DNR.** "DNR" means the Minnesota Department of Natural Resources.

(25) **Disinfection.** "Disinfection" means the process of destroying or inactivating pathogenic microorganisms in sewage to render them noninfectious.

(26) **Distinct.** "Distinct" means a soil color that is not faint as described in Section 2.2 (39).

(27) **Distribution box.** "Distribution box" means a device intended to distribute sewage tank effluent concurrently and equally by gravity to multiple segments of a soil dispersal system.

(28) **Distribution device.** "Distribution device" means a device used to receive and transfer effluent from supply pipes to distribution pipes or downslope supply pipes, or both. These devices include, but are not limited to, drop boxes, valve boxes, distribution boxes, or manifolds.

(29) **Distribution medium.** "Distribution medium" means the material used to provide void space in a dispersal component, through which effluent flows and is stored prior to infiltration. Distribution media includes, but is not limited to, drainfield rock, polystyrene beads, chambers, and gravelless pipe.

(30) **Distribution pipes.** "Distribution pipes" means perforated pipes that distribute effluent within a distribution medium.

(31) **Domestic waste.** "Domestic waste" means liquid waste produced by toilets, bathing, laundry, culinary operations, and the floor drains associated with these sources, and includes household cleaners, medications, and other constituents in sewage restricted to amounts normally used for domestic purposes. Domestic waste has a biochemical oxygen demand of 175 mg/L or less, a total suspended solids level of 65 mg/L or less, an oil and grease concentration of 25 mg/L or less and no hazardous wastes. Animal waste and commercial or industrial waste are not considered domestic waste.

(32) **Drip dispersal system.** "Drip dispersal system" means a small diameter pressurized wastewater distribution system in which the treated effluent is distributed under pressure to the infiltrative surface via drip tubing and enters the receiving environment.

(33) **Drop box.** "Drop box" means a distribution device used for the serial gravity application of sewage tank effluent to a soil dispersal system.

(34) **Dwelling.** "Dwelling" means any building with provision for living, sanitary, and sleeping facilities.

(35) **Effluent screen.** "Effluent screen" means a device installed on the outlet piping of a septic tank for the purpose of retaining solids of a specific size.

(36) **EPA.** "EPA" means the United States Environmental Protection Agency.

(37) **Even Distribution.** "Even Distribution" means a method that, upon activation of the SSTS, reliably distributes effluent over the entire required absorption area.

(38) **Existing system.** "Existing system" means a system that has been previously inspected and approved by the Department or local unit of government during installation. In addition, all operating systems installed before the adoption of this Chapter are considered existing systems.

(39) **Faint.** "Faint" means a soil color:

A. with the same hue as another soil color but that varies from the other color by two or less units of value and not more than one unit of chroma;

B. that differs from another soil color by one hue and by one or less units of value and not more than one unit of chroma; or

C. that differs from another soil color by two units of hue with the same value or chroma.

(40) **Fecal coliform or FC.** "Fecal coliform" or "FC", for the purposes of this Chapter, means bacteria common to the digestive systems of humans that are cultured in standard tests. Counts of these organisms are typically used to indicate potential contamination from sewage or to describe a level of disinfection, generally expressed in colonies per 100 mL.

(41) **Fine Sand.** "Fine sand" means a soil texture, as described in the Field Book for Describing and Sampling Soils, which is incorporated by reference in Section 2.2 (46) where more than 50 percent of the sand has a particle size range of 0.05 millimeters, sieve size of 270, to 0.25 millimeters, sieve size 60.

(42) **Flood fringe.** "Flood fringe" means that portion of the floodplain outside of the floodway. Flood fringe is in the Flood Insurance Study for Washington County and identified on the Flood Boundary and Floodway Maps as floodway fringe.

(43) **Floodplain.** "Floodplain" means the area covered by a 100-year flood event along lakes, rivers, and streams as published in technical studies by local, state, and federal agencies, or in the absence of these studies, estimates of the 100-year flood boundaries and elevations as developed according to Washington County.

(44) **Floodway.** "Floodway" means the bed of a wetland or lake, the channel of a watercourse, and those portions of the adjoining floodplain that are reasonably required to carry the regional flood discharge.

(45) **Flow measurement.** "Flow measurement" means any method to accurately measure water or sewage flow, including, but not limited to, water meters, event counters, running time clocks, or electronically controlled dosing.

(46) **Geomorphic description.** "Geomorphic description" means the identification of the landscape, landform, and surface morphometry of the proposed area of the soil treatment and dispersal system as described in the Field Book for Describing and Sampling Soils: Version 2.0 (2002), developed by the National Soil Survey Center and Natural Resources Conservation Service of the United States Department of Agriculture. The field book is incorporated by reference, is not subject to frequent change, and is available through the Minitex interlibrary loan system.

(47) **Graywater.** "Graywater" means sewage that does not contain toilet wastes. Liquid wastes from a dwelling or other establishment produced by bathing, laundry, culinary operation, and from floor drains associated with these sources are considered graywater.

(48) **Graywater system.** "Graywater system" means a system that receives, treats, and disperses only graywater or other similar system as designated by the commissioner.

(49) **Groundwater mound.** "Groundwater mound" means the rise in height of the periodically saturated soil or regional water table caused by the addition of sewage effluent from a subsurface sewage treatment system into the soil.

(50) **Hazardous waste.** "Hazardous waste" means any substance that, when discarded, meets the definition of hazardous waste in Minnesota Statutes, section 116.06, subdivision 11, Minnesota Rules 7045, or Washington County Ordinance No. 166.

(51) **Holding tank.** "Holding tank" means a tank for storage of sewage until it can be transported to a point of treatment and dispersal. Holding tanks are considered a septic system tank under Minnesota Statutes, section 115.55.

(52) **Individual subsurface sewage treatment system or ISTS.** "Individual subsurface sewage treatment system" or "ISTS" means an individual sewage treatment system or part thereof, as set forth in Minnesota Statutes, sections 115.03 and 115.55, that employs sewage tanks or other treatment devices with final discharge into the soil below the natural soil elevation or elevated final grade that are designed to receive a sewage design flow of 5,000 gallons per day or less. ISTS includes the holding tanks and privies, but does not include any pump tanks used in a sewage collection system. ISTS does not include building sewers or other components regulated under Minnesota Rules, Chapter 4715, or sewage collection systems.

(53) **Inner wellhead management zone.** "Inner wellhead management zone" means the drinking water supply management area for a public water supply well that does not have a delineated wellhead protection area approved by the Department of Health under Minnesota Rules, Chapter 4720, section 4720.5330.

(54) **Invert.** "Invert" means the lowest point of a channel inside a pipe.

(55) **Imminent Threat to Public Health or Safety.** "Imminent Threat to Public Health or Safety" means an ISTS which discharges sewage or sewage effluent to the ground surface, drainage system, ditches, or storm water drains or directly to surface water; or causes a reoccurring sewage backup into a dwelling or other establishment; or has an electrical hazard; or includes a sewage tank with an unsecured, damaged or weak maintenance hole cover; or an ISTS that has received hazardous waste, or other safety or health hazard as determined by those authorized in Minnesota Rules Chapter 7083

(56) **ISTS Failing to Protect Groundwater.** "ISTS Failing to Protect Groundwater" means a seepage pit, cesspool, drywell, leaching pit or other pit; or an ISTS that has less than the required vertical separation distance as described in Section 4.3 (4) & (5); or an ISTS not abandoned in accordance with Section 23; or any other threat to groundwater quality as determined by those authorized in Minnesota Rules, Chapter 7083.

(57) **Liquid capacity.** "Liquid capacity" means the liquid volume of a sewage tank below the invert of the outlet pipe or, for holding tanks and pump tanks, the liquid volume below the invert of the inlet.

(58) **Long-term sewage treatment.** "Long-term sewage treatment" shall mean enough space on a lot for two Type I or Type II soil treatment and dispersal areas.

(59) **Lot.** "Lot" means a parcel of land designated by metes and bounds, registered land survey, plat or other means, and which description is either recorded in the Office of the Washington County Recorder or Registrar of Titles or used by the County Treasurer or County Assessor to separate such parcel from other lands for tax purposes.

(60) **Management plan.** "Management plan" means a plan that requires the periodic examination, adjustment, testing, and other operational requirements to meet system performance expectations, including a planned course of action in the event a system does not meet performance expectations.

(61) **Matrix.** "Matrix" means the majority of the color in a soil horizon, as described in the Field Book for Describing and Sampling Soils, which is incorporated by reference in Section 2.2 (46).

(62) **Midsized subsurface sewage treatment system or MSTS.** "Midsized subsurface sewage treatment system" or "MSTS" means an individual sewage treatment system, or part thereof, as set forth in Minnesota Statutes, sections 115.03 and 115.55, that employs sewage tanks or other treatment devices with final discharge into the soil below the natural soil elevation or elevated final grade and that is designed to receive sewage from dwellings or other establishments with a design flow of greater than 5,000 gallons per day to 10,000 gallons per day. Design flows must be determined by Section 12.7. MSTS also includes on-lot septic tanks, holding tanks, and privies, but does not include any pump tanks used in a sewage collection system. MSTS does not include those components defined as plumbing under Minnesota Rules, Chapter 4715 or sewage collection systems.

(63) **Mottles.** "Mottles" means the minority of the variegated colors in a soil horizon, as described in the Field Book for Describing and Sampling Soils, which is incorporated by reference in Section 2.2 (46).

(64) **Mound system.** "Mound system" means a soil treatment and dispersal system designed and installed such that all of the infiltrative surface is installed above grade, using clean sand between the bottom of the infiltrative surface and the original ground elevation, utilizing pressure distribution and capped with suitable soil material to stabilize the surface and encourage vegetative growth.

(65) **MPCA.** "MPCA" means the Minnesota Pollution Control Agency.

(66) **NPDES permit.** "NPDES permit" means a National Pollutant Discharge Elimination System permit issued by the MPCA.

(67) **New construction.** "New construction" means installing or constructing a new ISTS or altering, extending, or adding capacity to an existing system.

(68) **Notice of noncompliance.** "Notice of noncompliance" means a document written and signed by a certified inspector after a compliance inspection that gives notice that an ISTS is not in compliance with this Chapter.

(69) **O&G.** "O&G" means oil and grease, a component of sewage typically originating from foodstuffs such as animal fats or vegetable oils or consisting of compounds of alcohol or glycerol with fatty acids such as soaps and lotions, typically expressed in mg/L (also known as FOG, or fats, oil and grease).

(70) **Ordinary high water level.** ""Ordinary high water level" means the boundary of water basins, watercourses, public waters, and public waters wetlands, and:

A. the ordinary high water level is an elevation delineating the highest water level that has been maintained for a sufficient period of time to leave evidence upon the landscape, commonly the point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial;

B. for watercourses, the ordinary high water level is the elevation of the top of the bank of the channel; and

C. for reservoirs and flowages, the ordinary high water level is the operating elevation of the normal summer pool.

(71) **Original soil.** "Original soil" means naturally occurring soil that has not been cut, filled, moved, smeared, compacted, altered, or manipulated to the degree that the loading rate must be reduced from that associated with natural soil conditions.

(72) **Other establishment.** "Other establishment" means any public or private structure other than a dwelling that generates sewage that discharges into an ISTS or MSTS.

(73) **Other pit.** "Other pit" means any pit or other device designed to leach sewage effluent that is greater than 30 inches in height or has a bottom area loading rate of sewage greater than two gallons per square foot per day.

(74) **Owner.** "Owner" means any person having possession of, control over, or title to property with an ISTS.

(75) **Parent material.** "Parent material" means the unconsolidated and chemically weathered geologic mineral or organic matter from which soils are developed by soil forming processes.

(76) **Percolation rate.** "Percolation rate" means the rate of a drop of water infiltrating into a test hole as specified in Section 9.7 (2).

(77) **Periodically saturated soil.** "Periodically saturated soil" means the highest elevation in the soil that is in a reduced chemical state due to soil pores filled or nearly filled with water causing anaerobic conditions. Periodically saturated soil is determined by the presence of redoximorphic features in conjunction with other established indicators as specified in Section 9.6 (5) or (6), or determined by other scientifically established technical methods or empirical field measurements acceptable to the local unit of government in consultation with the Department or the commissioner.

(78) **Permit.** "Permit" means a building, construction, sanitary, planning, zoning or other such permit issued for new construction, replacement, repair, alteration or extension of a subsurface sewage treatment system. Permit also means a permit issued for the addition of a bedroom or bathroom on property served by a subsurface sewage treatment system.

(79) **Permittee.** "Permittee" means a person who is named on a permit issued pursuant to these regulations.

(80) **Plastic limit.** "Plastic limit" means a soil moisture content above which manipulation will cause compaction or smearing. The plastic limit can be measured by American Society for Testing and

Materials, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils, ASTM D4318 (2005). The standard is incorporated by reference, is available through the Minitex interlibrary loan system, and is not subject to frequent change.

(81) **Pressure distribution.** "Pressure distribution" means a network of distribution pipes in which effluent is forced through orifices under pressure.

(82) **Privy.** "Privy" means an aboveground structure with an underground cavity meeting the requirements of Section 18.4 that is used for the storage or treatment and dispersal of toilet wastes, excluding water for flushing and graywater. A privy also means a nondwelling structure containing a toilet waste treatment device.

(83) **Proprietary product.** "Proprietary product" means a sewage treatment or distribution technology, method, or material subject to a patent or trademark.

(84) **Public domain technology.** "Public domain technology" means a sewage treatment or distribution technology, method, or material not subject to a patent or trademark.

(85) **Public waters.** "Public waters" means any public waters or wetlands defined in Minnesota Statutes, section 103G.005, subdivision 15, or identified as public waters or wetlands by the inventory prepared according to Minnesota Statutes, section 103G.201.

(86) **Pump tank.** "Pump tank" means a tank or separate compartment following the sewage tank that serves as a reservoir for a pump. A separate tank used as a pump tank is considered a septic system tank under Minnesota Statutes, section 115.55, subdivision 1, paragraph (o).

(87) **Redoximorphic features.** "Redoximorphic features" means:

A. a color pattern in soil, formed by oxidation and reduction of iron and manganese in saturated soil coupled with their removal, translocation, or accrual, which results in the loss (depletion) or gain (concentration) of mineral compounds compared to the matrix color; or

B. a soil matrix color controlled by the presence of ferrous iron. Redoximorphic features are described in Section 9.6 (5).

(88) **Replacement.** "Replacement" means the removal or discontinued use of any major portion of an ISTS and reinstallation of that portion of the system, such as reinstallation of a new sewage tank, holding tank, pump tank, privy, or soil dispersal system.

(89) **SDS permit.** "SDS permit" means a State Disposal System permit issued by the MPCA.

(90) **Sand.** "Sand" means a sand soil texture, as described in the Field Book for Describing and Sampling Soils, which is incorporated by reference in Section 2.2 (46).

(91) **Seepage bed.** "Seepage bed" means a soil treatment and dispersal system, the absorption width of which is greater than three feet but no greater than 25 feet.

(92) **Seepage pit.** "Seepage pit" means an underground pit that receives sewage tank effluent and from which the liquid seeps into the surrounding soil.

(93) **Septage.** "Septage" means solids and liquids removed from an SSTS and includes solids and liquids from cesspools, seepage pits, other pits, or similar systems or devices that receive sewage.

Septage also includes solids and liquids that are removed from portable, incinerating, composting, holding, or other toilets. Waste from Type III marine sanitation devices, as defined in Code of Federal Regulations, title 33, section 159.3, and material that has come into contact with untreated sewage within the past 12 months is also considered septage.

(94) **Septic tank.** "Septic tank" means any watertight, covered receptacle that is designed and constructed to receive the discharge of sewage from a building sewer or preceding tank, stores liquids for a detention period that provides separation of solids from liquid and digestion of organic matter, and allows the effluent to discharge to a succeeding tank, treatment device, or soil dispersal area.

(95) **Serial distribution.** "Serial distribution" means distribution of sewage tank effluent by gravity flow that progressively loads one section of a soil treatment and dispersal system to a predetermined level before overflowing to the succeeding section and does not place a dynamic head on the lower section of the soil treatment and dispersal system. The distribution medium is allowed to serve as a conveyance medium to the next section.

(96) **Setback.** "Setback" means a separation distance measured horizontally.

(97) **Sewage.** "Sewage" means waste produced by toilets, bathing, laundry, culinary operations, and the floor drains associated with these sources, and includes household cleaners, medications, and other constituents in sewage restricted to amounts normally used for domestic purposes.

(98) **Sewage flow.** "Sewage flow" means flow as determined by measurement of actual water measurement; or, if actual measurements are not available, by the best available data provided.

(99) **Sewage tank.** "Sewage tank" means a receptacle used in the containment or treatment of sewage and includes, but is not limited to, septic tanks, aerobic tanks, pump tanks, and holding tanks. Requirements for sewage tanks are described in Section 13 of this Chapter. Sewage tanks are considered a septic system in Minnesota Statutes, section 115.55, subdivision 1, paragraph (o).

(100) **Sewage tank effluent.** "Sewage tank effluent" means the liquid that flows from a septic tank or other treatment device.

(101) **Site.** "Site" means the area required for the proper location of the soil treatment system.

(102) **Slope.** "Slope" means the vertical rise or fall divided by the horizontal distance, expressed as a percentage.

(103) **Soil dispersal area.** "Soil dispersal area" means the area required for the soil dispersal system, including space between individual units or zones.

(104) **Soil dispersal system.** "Soil dispersal system" means a system where sewage effluent is dispersed into the soil for treatment by absorption and filtration and includes, but is not limited to, trenches, seepage beds, at-grade systems, mound systems and drip dispersal systems.

(105) **Soil texture.** "Soil texture" means the soil particle size classification and particle size distribution as specified in the Field Book for Describing and Sampling Soils, incorporated by reference in Section 2.2 (46).

(106) **Subsoil.** "Subsoil" means a soil layer that has a moist color value of 3.5 or greater and has undergone weathering and soil formation processes.

(107) **Subsurface sewage treatment system or SSTS.** "Subsurface sewage treatment system" or "SSTS" is either an individual subsurface sewage treatment system as defined in Section 2.2 (52) or a midsized subsurface sewage treatment system as defined in Section 2.2 (62), as applicable.

(108) **Supply pipe.** "Supply pipe" means a nonperforated pipe, the purpose of which is to transport sewage tank effluent.

(109) **Systems in shoreland areas or wellhead protection areas or systems serving food, beverage, or lodging establishments, or SWF.** "Systems in shoreland areas or wellhead protection areas or systems serving food, beverage, or lodging establishments", or "SWF", means the following three categories:

A. SSTS constructed in shoreland areas where land adjacent to public waters has been designated and delineated as shoreland in Chapter Six of the Washington County Development Code;

B. SSTS constructed in wellhead protection areas regulated under Minnesota Statute, chapter 103I; and

C. SSTS serving food, beverage, and lodging establishments that are required to obtain a licenses under Minnesota Statutes, section 157.16, subdivision 1, and Washington County Ordinance No. 145 or 146, and includes manufactured home parks and recreational camping areas licensed according to Minnesota Statutes, chapter 327 and Washington County Ordinance No. 147.

(110) **TN.** "TN" means total nitrogen, which is the measure of the complete nitrogen content in wastewater, including nitrate (NO_3^-), nitrite (NO_2^-), ammonia (NH_3), and organic nitrogen, expressed as mg/L.

(111) **TP.** "TP" means total phosphorus, which is the sum of all forms of phosphorus in effluent, expressed in mg/L.

(112) **Ten-year flood.** "Ten-year flood" means the flood which can be expected to occur, on an average, of once in ten years, or the elevation to which flood waters have a ten percent chance of rising in any given year.

(113) **Toilet waste.** "Toilet waste" means waste commonly disposed of in toilets, including fecal matter, urine, toilet paper, and water used for flushing.

(114) **Toilet waste treatment devices.** "Toilet waste treatment devices" means other toilet waste apparatuses including incinerating, composting, biological, chemical, recirculating, or holding toilets or portable restrooms.

(115) **Topsoil.** "Topsoil" means the natural, in-place organically enriched soil layer with a color value of less than 3.5.

(116) **Topsoil borrow.** "Topsoil borrow" means a loamy soil material having:

A. less than five percent material larger than two millimeters, No. 10 sieve;

B. no material larger than 2.5 centimeters;

C. a moist color value of less than 3.5; and,

D. adequate nutrients and pH to sustain healthy plant growth.

(117) **Total suspended solids or TSS.** "Total suspended solids" or "TSS" means solids that are in suspension in water and that are removable by laboratory filtering, expressed as mg/L.

(118) **Trench.** "Trench" means a soil treatment and dispersal system, the absorption width of which is 36 inches or less.

(119) **Valve box.** "Valve box" means a watertight structure designed for alternate distribution of sewage tank effluent to segments of a soil treatment system.

(120) **Vertical separation.** "Vertical separation" means the vertical measurement of unsaturated soil or sand between the bottom of the distribution medium and the periodically saturated soil level or bedrock.

(121) **Watertight.** "Watertight" means constructed so that no liquid can get into or out of a device except through designed inlets and outlets.

(122) **Well capture zone.** "Well capture zone" means the surface and subsurface area that supplies water to a water supply well.

(123) **Wellhead protection area.** "Wellhead protection area" means the surface and subsurface area surrounding a well or well field that supplies a public water system, through which contaminants are likely to move toward and reach the well field as regulated under Minnesota Rules, Chapter 4720. For the purposes of this chapter, wellhead protection area is that area bounded by the drinking water supply management area as regulated under Minnesota Rules, Chapter 4720.

SECTION 3 ADMINISTRATION

3.1 This chapter shall apply and be in effect in all areas in Washington County other than cities and towns that have adopted ordinances that comply with Minnesota Statute Section 115.55, Minnesota Rules, Chapter 7082, and are as strict as this Chapter. Pursuant to Chapter One, the Washington County Department of Public Health and Environment shall be the Administrator of these regulations.

3.2 SSTS must be designed, constructed and operated according to this Chapter, except as modified through a local ordinance in compliance with Minnesota Rules, Chapter 7082, Minnesota Statutes, section 115.55, and this Chapter.

3.3 SSTS, including both ISTS and MSTS, must be designed, installed, inspected, pumped, serviced, and operated by licensed businesses and certified individuals meeting the qualifications in Minnesota Rules 7083.0700 to 7083.2040 and any other applicable state or local requirements.

3.4 SSTS that are designed to receive sewage or nonsewage from a two family dwelling or greater or receive sewage or nonsewage from another establishment that serves more than 20 persons per day, are regulated by the United States Environmental Protection Agency as Class V injection wells under Code of Federal Regulations, title 40, parts 144 and 146. Code of Federal Regulations, title 40, parts 144 and 146, prescribe additional design regulations applicable to certain systems designed under this Chapter. In addition, single family dwellings that receive nonsewage wastewater are regulated by these federal regulations. All systems that receive hazardous wastes are regulated by the Unites States Environmental Protection Agency as Class IV injection wells. Disposal of hazardous waste must be according to state and federal regulations. The owner or owner's agent of a new or replacement system classified as a Class V injection wells shall submit to the commissioner of the MPCA and the United States Environmental Protection Agency the inventory information specified in Code of Federal Regulations, title 40, section 144.26. All Class V injection wells must be identified as such in property transfer disclosures.

3.5 If the Department finds that by reason of exceptional circumstances, the strict enforcement of any provisions of this Chapter would cause undue hardship or that strict conformity with the standards would be unreasonable, impractical, or not feasible under the circumstances, the Department may permit modifications in individual cases based on conditions it may prescribe for prevention, control or abatement of pollution. The Department or local unit of government cannot issue variances for Sections 4.1, 4.7, 4.9, 4.10, and Sections 16.2 (1) through Section 16.2 (4). The Department or local unit of government can grant a variance for Section 4.9 (4) (A) for replacement MSTS serving existing dwellings or other establishments..

3.6 Consistent with the procedures in Chapter One, Section 6.1 (1), the Washington County Board of Adjustment and Appeals shall hear and decide appeals of any order, decision or determination made by the department regarding the enforcement of this Chapter. Appeals of any administrative decision or determination may be filed by any person, county department, or township.

3.7 Consistent with the procedures in Chapter One, Section 6.1 (2), the Washington County Board of Adjustment and Appeals shall hear and decide all requests for variance to the requirements of this Chapter.

3.8 All subsurface sewage treatment systems installed subsequent to the adoption of this Chapter and all alterations, extensions, modifications or repairs to existing systems irrespective of the date of original installation shall be regulated in accordance with all requirements of this Chapter.

3.9 All MSTS must be designed and operated according to this Chapter. All MSTS must be designed, installed, inspected, pumped and operated by licensed businesses meeting the qualifications of Minnesota Rules, Chapter 7083. All MSTS must conform to applicable state statutes and rules. All septage generated from

MSTS must be treated and dispersed to applicable standards for septage in Code of Federal Regulations, title 40, part 503, and any local requirements.

3.10 Any new or existing system which discharges to surface waters or the ground surface must obtain either an NPDES or an SDS permit from the MPCA and shall comply with all NPDES or SDS requirements.

3.11 MSTS must conform to all applicable state statutes and rules. MSTS serving establishments licensed or regulated by the State of Minnesota, or MSTS owned by the State of Minnesota, must conform to this Chapter.

3.12 Any SSTS requiring approval from the State of Minnesota shall also comply with all requirements of this Chapter, and all local codes and ordinances.

3.13 Where work requiring a permit under this Chapter has commenced without first having obtained such permit, work shall be ordered to stop by the Department until all required permits have been approved and issued.

3.14 To enforce this Chapter, the Department or its authorized agent may enter a building, property, or a place where there is reason to suspect that a system is failing to protect groundwater or an imminent threat to public health and safety.

3.15 Fees for permits, operating permits, inspections, or other services rendered under this Chapter shall be established by the Washington County Board of Commissioners.

SECTION 4 COMPLIANCE CRITERIA

4.1 **Treatment required.** Sewage discharged from a dwelling or other establishment that is not served by a system issued a permit containing effluent and discharge limits or specific monitoring requirements by the Department or Agency must be treated according to applicable requirements.

4.2 **Compliance criteria for new construction.** An SSTS regulated under a current permit is considered compliant if it meets the applicable requirements of Section 16 to Section 21.

4.3 **Compliance criteria for existing systems.** To be in compliance, an existing SSTS must meet the provisions of this subpart.

(1) The SSTS must be protective of public health and safety. A system that is not protective is considered an imminent threat to public health or safety. At a minimum, a system that is an imminent threat to public health or safety is a cesspool, seepage pit, drywell or leaching pit, a system with discharge of sewage or sewage effluent to the ground surface, drainage systems, ditches, or storm water drains or directly to surface water; systems that cause a reoccurring sewage backup into a dwelling or other establishment; systems with electrical hazards; or sewage tanks with unsecured, damaged, or weak maintenance hole covers. A determination of protectiveness for other conditions must be made by a qualified employee of the Department or licensed inspection business.

(2) The SSTS must be protective of groundwater. A system that is not protective is considered a system failing to protect groundwater. At a minimum, a system that is failing to protect groundwater is a system that is a seepage pit, cesspool, drywell, leaching pit, or other pit; a system with less than the required vertical separation distance described in Section 4.3 (4) and Section 4.3 (5) of this Section; and a system not abandoned in accordance with Section 23. A determination of the threat to groundwater quality for other conditions must be made by a qualified employee of the Department or local unit of government or licensed inspection business.

(3) The SSTS must be operated, meet performance standards, and be managed according to its operating permit.

(4) SSTS built after March 31, 1996, or in an SWF area as defined in Section 2.2 (109), shall have a three (3) foot vertical separation. No more than a fifteen (15) percent reduction in the vertical separation distance is allowed to account for settling of sand or soil, normal variation of measurements, and interpretations of the limiting layer conditions.

(5) SSTS built before April 1, 1996, in areas that are not SWF areas as defined in Section 2.2 (109), must have at least two (2) feet of vertical separation.

(6) The vertical separation measurement for Section 4.3 (4) and Section 4.3 (5) shall be measured outside of the area of system influence in an area of similar soil and on the same contour elevation.

(7) An existing system which is found to be an imminent threat to public health and safety by either a qualified employees of the Department, local unit of government, or a licensed inspection business, is hereby declared to be a public health nuisance and shall be repaired, upgraded, replaced or its use discontinued within thirty (30) days of notice and order to comply by the Department. Any further discharge of effluent must be stopped immediately (by such methods as reducing or stopping all water use or pumping the tank as necessary) until such time as the system is corrected.

(8) Any existing system which is found to be failing to protect groundwater shall be replaced or otherwise brought into compliance within ninety (90) days of notice and order to comply by the Department.

(9) An existing system that is not otherwise considered an imminent threat to public health and safety and which was constructed under a permit issued by the Department, or other local unit of government that verified that the required vertical separation existed at the time of installation, need not be upgraded, repaired, replaced, or its use discontinued notwithstanding the fact that at the time of a compliance inspection, there appears to be less than the required vertical separation between the system bottom and any limiting layer.

4.4 **Compliance criteria for systems with a flow of greater than 2,500 gallons per day.** In addition to the requirements under Section 4.3, systems designed under Section 16.4 must demonstrate that the additional nutrient reduction component required under those items is in place and functioning.

4.5 **Compliance criteria for systems receiving replacement components**. Components of an existing system that result in the system being in noncompliance must be repaired or replaced according to this Chapter. The repaired or replacement components must meet technical standards and criteria of this Chapter. The remaining components of the existing system must result in the system being in compliance with Section 4.3. If a compliant existing sewage tank is to be used with the design of the new soil dispersal system, the tank must also be baffled and be watertight.

4.6 New construction, replacement, or existing MSTS designed under this Chapter are considered conforming if they meet the requirements of this Chapter. Existing MSTS constructed before the effective date of this Chapter are considered conforming if they meet the requirements of this Section, except for Section 4.9 (4) and Section 4.9 (5).

4.7 To be in compliance, all MSTS must:

(1) have treatment processes and devices that do not allow sewage or sewage effluent contact with humans, insects, or vermin;

(2) disperse sewage effluent into our soil or sand below final grade, with the effluent remaining below final grade;

(3) not discharge to drainage tile, the ground surface, or surface water or back up sewage into dwellings or other establishments;

(4) treat and disperse sewage effluent in a safe manner, including protection from physical injury and harm; and

(5) not have received hazardous material.

4.8 MSTS must be considered an imminent threat to public health and safety for noncompliance with Section 4.7 and any other condition that poses an imminent threat as determined by a qualified employee of the Department or licensed MSTS inspection business.

4.9 To be in compliance, all MSTS must:

(1) maintain a zone of unsaturated soil between the bottom of the soil treatment and dispersal system and the periodically saturated soil or bedrock during loading of effluent, as described in Section 16.5 (9).

(2) not be seepage pits, cesspools, drywells, leaching pits, sewage tanks, and treatment vessels that observably leak below the designated operating depth;

(3) not allow viable fecal organisms to contaminate underground waters or zones of seasonal saturation;

(4) employ nitrogen reduction processes that reduce nitrogen contribution to groundwater as determined:

(A) if the discharge from an MSTS will impact water quality of an aquifer, as defined in Minnesota Rules, Chapter 4725.0100, subpart 21, the effluent from an MSTS, in combination with the effective recharge to the groundwater, must not exceed a concentration of total nitrogen of 10 mg/L or greater at the property boundary or nearest receptor, which is closest; or

(B) if the discharge from an MSTS will not impact water quality of an aquifer, as defined in Minnesota Rules, Chapter 4725.0100, subpart 21, best management practices developed by the Commissioner to mitigate water quality impacts to groundwater must be employed; and

(5) not exceed a groundwater discharge of phosphorus to a surface water that exceeds the phosphorus standard to the receiving water.

4.10 To be in compliance, all MSTS must meet the following requirements:

(1) All methods and devices used to treat and disperse sewage must be designed to conform to all applicable federal, state and local regulations.

(2) Systems no longer in use must be abandoned according to Section 23.

4.11 To be in compliance, MSTS must meet performance standards and be operated and managed according to its operating permit and management plan, as described in Section 22.1. To be in compliance, an MSTS designed before the effective date of this Chapter must be operated according to applicable requirements in Section 22.

4.12 Components of existing MSTS that cause non-compliance must be repaired or replaced. The repaired or replaced components must meet technical standards and criteria of this Chapter. The remaining components must comply with Section 4.1 to Section 4.10, including Section 4.9 (4), if constructed after the effective date of this Chapter.

4.13 MSTS in compliance with this Chapter shall be issued a certificate of compliance. MSTS found not in compliance with this Chapter shall be issued a notice of noncompliance.

4.14 MSTS issued a notice of noncompliance based on the criteria in Sections 4.7 and 4.8 shall be repaired ore replaced within 30 days or as directed by Minnesota Statutes, Chapter 145A, whichever is more restrictive.

4.15 MSTS issued a notice of noncompliance based on criteria in Section 4.9 or Section 4.10 shall be repaired or replaced according to this chapter.

4.16 Systems issued a notice of non-compliance based on criteria in Section 4.11 must immediately be maintained, monitored, or managed according to the operating permit.

SECTION 5 ACCEPTABLE AND PROHIBITED DISCHARGES

5.1 This Chapter provides design standards for SSTS that receive sewage. If an SSTS receives both sewage and nonsewage, the requirements of this chapter and requirements governing the nonsewage portion of the water apply.

5.2 Footing or roof drainage and chemically treated hot tub and pool water must not be discharged into any part of the system.

5.3 Products containing hazardous waste must not be discharged to a system, other than in normal amounts of household products and cleaners designed for household use. Substances not intended for use in household cleaning, including but not limited to, solvents, pesticides, flammables, photo finishing chemicals, paint, and dry-cleaning chemicals must not be discharged to the system. Other unused products or substances, or unused medicines, must not be discharged to the system solely as a disposal method.

5.4 Floor drains from garages serving dwellings, vehicle maintenance businesses, or any other floor drain that has the potential to introduce hazardous waste into the system, must not be connected to the system.

5.5 Only domestic waste shall be discharged to a soil dispersal and treatment area. Sewage tank effluent with a waste strength higher than domestic waste shall be pre-treated to a level equal to or less than domestic waste prior to final treatment and disposal in a soil treatment and dispersal area.

SECTION 6 PERMITS

6.1 No construction shall be allowed by any local unit of government until the permit required for the subsurface sewage treatment system has been issued.

6.2 No additions, enlargements, improvements, or remodeling involving fifty (50) percent or more of the structure, or alterations that would affect the water use, such as bedrooms, bathrooms or additions to living space (excluding such areas as screen porches, entry ways, decks, attics, patios, nonhabitable storage space) shall be allowed until the subsurface sewage treatment system has been determined to be both adequate and conforming or a permit for a new treatment system has first been issued.

6.3 Permits shall be required for subsurface sewage treatment systems as follows:

(1) All new installations of sewage tanks, soil dispersal and treatment areas, and components thereof;

(2) All repair, extension, replacement or modification of existing systems and components; or

(3) Any change in use of a facility served by a subsurface sewage treatment system.

6.4 Permits shall not be required for normal routine inspection and maintenance of approved individual subsurface sewage treatment systems that do not require an operating permit.

6.5 Permit applications shall be made in writing on forms provided by the Department and shall contain data, including, but not limited to, to be considered a completed permit application:

(1) Correct legal description of the property, including Property Identification Number or GEO Code;

(2) Site plan, drawn to scale, showing the location of all proposed and existing structures, property lines, water supply wells within 100 feet, terrain features, such as blufflines, water bodies or water ways, buried utilities, easements, and other unique features of the site;

(3) Soil test date, including soil boring logs, percolation test data with field notes (where required) and location and identification of test area.

(4) Plans and details of the proposed installation of work, including engineering data and final design.

(5) Building plans showing existing and proposed room arrangement and uses.

(6) For other than dwellings, calculated or measured water use rates, occupancy and occupant load.

(7) In certain cases, a property survey may be required identifying property characteristics and including such items as elevations, contour lines, normal high water marks, and ten (10) year and one hundred (100) year flood elevations.

(8) Evidence of compliance with state or other jurisdiction regulations where applicable.

(9) A management plan for the proposed system, as described in Section 22.1.

6.6 No permit will be issued until a detailed system design is submitted for the current proposed construction, including site plan, a management plan and at least one current soil boring if there is reason to believe soil conditions have been altered since the original soil testing.

6.7 Permits shall be valid upon issuance and shall continue for a period of one (1) year. After one (1) year, the permit may be renewed if no changes are proposed. Such renewal shall require reapplication and payment of the established fee.

6.8 Permits issued under this Chapter may be revoked upon written notice by the department when such permit has been issued based on erroneous or inaccurate data supplied by the applicant or erroneous interpretation of the law by a building official.

SECTION 7 OPERATING PERMITS

7.1 Operating permits are required for the following systems:

(1) Type III Systems

(2) Type IV Systems

(3) Type V Systems

(4) All MSTS

(5) Holding tanks as described in Section 18.5.

(6) Food, Beverage and Lodging Establishments that discharge high-strength waste to the soil treatment area.

(7) Hazardous Waste Generators with subsurface sewage treatment systems.

7.2 Operating permits will be issued by the Department or the local unit of government.

7.3 Operating permits must include:

(1) Maintenance requirements, including frequency of maintenance.

(2) Operational requirements.

(3) Compliance limits and boundaries.

(4) Reporting frequency.

(5) A requirement that the permittee notify the Department or local unit of government when permit requirements are not met. Corrective actions must be taken as directed by the Department of local unit of government.

(6) Disclosure of the location and condition of the additional soil treatment and dispersal system; and

(7) A stipulation of acceptable and prohibited discharges.

SECTION 8 INSPECTIONS

8.1 Inspections as required to determine compliance with this Chapter shall be performed by the Department or its authorized agent under the following circumstances:

(1) Site inspections to verify and evaluate soil and site conditions and to determine the suitability of soils and system design prior to permit issuance.

(2) Necessary investigation to determine compliance of existing systems at the time of remodeling, alteration or additions.

(3) For all new SSTS construction or replacement.

(4) Mound systems require a minimum of three construction inspections:

(A) When the original soil under the mound has been roughened, but prior to placement of the sand fill. Enough of the proposed sand fill must be present to be viewed.

(B) After placement of rock and piping, but prior to cover.

(C) When the mound is completed.

8.2 Installation inspections shall be made by the Department prior to any work having been covered by backfill.

8.3 The licensed installation business shall be responsible to notify the Department a minimum of twenty-four (24) hours prior to the time work is ready for inspection or reinspection.

8.4 Work which is backfilled prior to a required inspection may be ordered to be uncovered whenever necessary to determine compliance.

8.5 If upon inspection any part of the system is determined not to be in compliance with this Chapter, written notice shall be provided by the Department indicating the deficiency and the required corrections. Noted deficiencies shall be properly corrected and reinspected before any other work on the project is continued.

8.6 No system shall be placed or replaced in service until a final inspection has been completed and the system installation has been approved.

8.7 The owner or occupant of a property shall be responsible to provide access at a reasonable time to the Department or its authorized agent for the purpose of performing inspections required under this Chapter.

8.8 The Contractor, upon completion of installation, shall file with the Department as-built drawings indicating the location of system components dimensioned from a permanent reference point.

8.9 If an inspection is conducted as a part of preparation of the disclosure required by Minnesota Statutes 115.55, subd. 6 and such inspection is conducted by a party who is not the property owner, such party must be licensed in accordance with MPCA rules and regulations and the notice of compliance or noncompliance provided to the property owner must also be provided to Washington County within thirty (30) days of the inspection.

8.10 Compliance Inspections must be conducted:

(1) to ensure compliance with applicable requirements;

(2) prior to the transfer of any real property, unless the age of the system is less than 5 years.

(3) to ensure compliance before issuance of a permit for the addition of a bedroom on property served by an SSTS;

(4) for all new construction or replacement;

(5) by a qualified employee or licensed inspection business, authorized by the Department or local unit of government, who is independent of the owner and the installer; and

(6) for an evaluation, investigation, inspection, recommendation, or other process used to prepare a disclosure if conducted by a party who is not the system owner. The disclosure action constitutes a compliance inspection and must be conducted according to Minnesota Rules, Chapter 7082;

(7) when deemed necessary by the Department to ascertain the compliance of an existing system.

8.11 A licensed inspection business that inspects an existing SSTS is allowed to subsequently design and install a new SSTS for that property, provided the inspection business is also licensed to design and install. A licensed inspection business working on behalf of the Department or local unit of government must not design or install a system if there is likelihood that the inspector or business will be responsible for permitting or inspecting the system or system site. A person working for or on behalf of the Department or local unit of government is not allowed to use the person's position to solicit for private business gain.

8.12 An appropriately licensed SSTS business may inspect an existing system which they installed once it has been independently inspected.

8.13 Certificate of compliance; notice of noncompliance.

(1) SSTS in compliance with applicable requirements must be issued a certificate of compliance and systems found not in compliance must be issued a notice of noncompliance. SSTS not in compliance with Section 4.3 (1) or Section 4.7 must be repaired or replaced within 30 days or as directed under Minnesota Statutes, chapter 145A. Systems out of compliance with other applicable requirements must be repaired or replaced according to local ordinance requirements. Systems issued a notice of noncompliance for operational or monitoring deficiencies must immediately be maintained, monitored, or managed according to the operating permit.

(2) The initial certificate of compliance must be issued if reasonable assurance is evident that the system was built according to applicable requirements as specified in the construction permit.

(3) The certificate of compliance for new construction and replacement must include the vertical separation distance report described in Section 8.14 (2)(B), and the management plan developed under Section 22.1. All certificates of compliance and notices of noncompliance for new construction and replacement must include property and property owner identification, date of inspection, system components, system location (dimensioned or drawn to scale), well setback distance, field check of soil conditions, SWF, as defined under part Section 2.2 (109), designations as applicable, and Class V designation as applicable.

(4) A certificate of compliance or notice of noncompliance for new construction or replacement must be signed by a qualified employee certified as an inspector who is authorized by the Department or local unit of government. The certificate of compliance or notice of noncompliance for new construction and replacement must be submitted to the owner or owner's agent within 15 days.

(5) A certificate of compliance or notice of noncompliance must include a certified statement from the qualified employee who conducted the compliance inspection and indicate whether the SSTS is in compliance with this Chapter.

(6) If a compliance inspection indicates that the system is not in compliance with applicable requirements, the notice must contain a statement to this effect.

(7) Certificates of compliance for new construction or a replacement system remain valid for five years from the date of issuance unless the Department or local unit of government finds evidence of noncompliance.

8.14 Certificate of compliance; notice of noncompliance; existing systems.

(1) The agency's existing SSTS inspection report forms shall be used for existing system compliance inspections.

(2) An inspection for existing SSTS must verify the conditions in subitems (A) to (C).

(A) Sewage tanks must be assessed for leakage below the operating depth. A leakage report must be completed that includes the method or methods used to make the assessment. The assessment must be made by either a licensed SSTS business, except a design business, or a qualified employee with an SSTS certification, except as a designer. A passing report is valid for three years unless the certified individual has reason to believe that a new inspection is to be conducted and the tank is found not to be watertight.

(B) The vertical separation distance from the bottom of the soil dispersal system and the periodically saturated soil or bedrock must be verified. This verification must be achieved by either conducting soil borings or by prior verifications by two independent parties. The soil borings used for system design or previous inspections qualify as a verification. A vertical separation distance report must be completed that includes the method or methods used to make the assessment and includes any previous soil borings. The assessment must be made by either a licensed inspection or design business or a qualified employee inspector with jurisdiction. If the verification separation report consists of verifications by two independent parties, a subsequent verification is not required unless the inspector has reason to believe a noncompliant condition exists.

(C) Sewage backup, surface seeping, or surface discharge from the system must be determined. A hydraulic function report must be completed that includes the method or methods used to make the assessment. The assessment must be made by either a licensed inspection business or a qualified employee with an inspector certification. A passing report is valid until a new inspection is requested or if the hydraulic performance is believed to have changed.

(3) A certificate of compliance for an existing system compliance inspection shall be based on the results of the verifications in item 2. The certificate of compliance for an existing system compliance inspection must be signed by a licensed inspection business or a qualified employee certified as an inspector. The certificate or notice for an existing system compliance inspection must be submitted to the Department or local unit of government with jurisdiction and the property owner or owner's agent no later than 15 days after a compliance inspection. The completed form must also be submitted to the owner or owner's agent. The certificate of compliance for an existing system compliance inspection is valid for three years from the date of issuance, even if one of the supporting reports expires before the three-year period, unless an inspector finds evidence of noncompliance.

(4) If a compliance inspection for an existing system indicates that the system is noncompliant, the notice must be signed by a licensed inspection business or qualified employee certified as an inspector and contain a statement to that effect and specify what must be done to achieve compliance.

8.15 Periodically saturated soil disagreements.

(1) If a documented discrepancy arises on the depth of the periodically saturated soil between licensed businesses for SSTS design or compliance purposes, all disputing parties must follow the procedure outlined in this subpart.

(2) One or more of the methods in units (A) to (C) must be employed.

(A) Obtain an opinion from a qualified employee of the Department or local permitting authority with jurisdiction, if the Department or local permitting authority is willing to provide an opinion.

(B) Obtain an opinion from an SSTS technical evaluation committee, if a committee has been developed for this purpose and is available and willing to render an opinion. The committee must be created in cooperation with the commissioner.

(C) Obtain an opinion from a Minnesota licensed professional soil scientist who is a certified SSTS designer or inspector and who is independent of, and agreed upon by, both parties.

(D) If options under Section 8.15 (2)(A) or Section 8.15 (2)(B) are not viable, an opinion must be rendered under Section 8.15 (2)(C).

(3) If opinions rendered in items Section 8.15 (1) or Section 8.15 (2) do not resolve the dispute, all initial and follow-up documents and information generated must be submitted to the Department or local unit of government. The Department or local unit of government shall take into consideration all information and opinions rendered and make a final judgment. The Department or local unit of government shall render findings of fact, conclusions of law, and findings setting forth the reasons for any final decisions it renders.

(4) If a documented discrepancy arises on the depth of the periodically saturated soil between an SSTS licensed business and the Department or local unit of government for SSTS design or compliance purposes, all disputing parties shall follow the procedure outlined in this item.

(A) The Department or local unit of government and the licensed business must meet at the disputed site in an attempt to resolve differences.

(B) If the provision in Section 8.15 (4)(A) does not resolve differences, then one or more of the methods in Section 8.15 (2)(B) or Section 8.15 (2)(C), are allowed to be employed.

(C) If opinions in Section 8.15 (4)(B) are not sought or do not resolve the dispute, the Department or local unit of government shall take into consideration all information and opinions rendered and make a final judgment. The Department or local unit of government shall render findings of fact, conclusions of law, and findings setting forth the reasons for any final decisions they render.

(5) Upon resolution of a dispute, amendments to initial disputed documents containing the resolution shall be made and submitted to the Department or local unit of government and all other parties involved.

SECTION 9 SITE EVALUATION AND SOIL TESTING

9.1 Site evaluations consisting of preliminary and field evaluations according to parts this Section must be conducted for all proposed sites for SSTS, including both ISTS and MSTS. The site evaluation is considered the first phase of an SSTS design.

9.2 A preliminary evaluation for individual subsurface sewage treatment systems shall consist of determination, location, or existence of the following items:

(1) Design flow for the dwelling, dwellings, or other establishments.

(2) Proposed or existing:

(A) Water supply wells within 100 feet of the proposed SSTS;

(B) Existing and proposed buildings or improvements on the lot; and,

(C) Buried water supply pipes within 50 feet of the proposed system.

(3) Easements on the lot.

(4) The ordinary high water level of public waters, if adjacent to the lot.

(5) Floodplain designation and flooding elevation from published data or data that is acceptable to and approved by the Department or local unit of government or the DNR, if applicable.

(6) Property lines.

(7) All required setbacks from the system.

(8) The soil characteristics at the proposed soil treatment and dispersal areas as obtained by the soil survey report, including the soil map, map units, landscape position, parent material, flooding potential, slope range, periodically saturated soil level, depth to bedrock, texture, color, depth to redoximorphic features, and structure and consistence of soil horizons.

(9) A geocode or property identification number.

(10) Names of property owners.

(11) The inner wellhead management zone or wellhead protection area of a public water supply, if applicable.

9.3 A field evaluation for an individual subsurface sewage treatment system shall consist of the following items:

(1) Lot lines shall be confirmed in the field using the most recent document source. Lot improvements, required setbacks, and easements must be identified.

(2) The following surface features must be described:

(A) The percent and direction of the slope of the proposed system location.

(B) Vegetation types.

(C) Any evidence of cut or filled areas or disturbed or compacted soil.

(D) The flooding or run-on potential.

(E) A geomorphic description.

9.4 For subdivision or lot approval testing, enough soil observations must be conducted to assure that suitable soil exists for each lot for long-term sewage treatment outlining an area with enough space on the lot for two soil treatment and dispersal areas. This tested area must be at least 10,000 square feet. Percolation tests are not required for subdivision or lot approval testing unless the permeability cannot be estimated or there is reason to believe the soil is not original or has been disturbed.

9.5 Complete soil testing on each individual lot must be conducted prior to permit issuance independent of any prior subdivision or lot approval testing. For permit issuance, a minimum of four (4) soil observations outlining an area of 5,000 square feet are required. At least one soil observation must be performed in the portion of the soil treatment area anticipated to have the most limiting conditions. Larger areas may be required where conditions of use, soils, topography, or vegetation require. Soil observations must comply with the following requirements:

(1) The soil observation must be conducted within or on the borders of the proposed site;

(2) The soil observations must be performed in an exposed pit or by hand augering or probing. The use of flight augers is not allowed.

(3) The soil observation method must allow observation of the different soil horizons that constitute the soil profile and, if determining the loading rate by use of Table IX in Minnesota Rules, Chapter 7080.2150[1] undisturbed soil structure must be observed.

(4) Soil observations must be conducted prior to any required percolation tests to determine whether the soils are suitable to warrant percolation tests and, if suitable, at what depth percolation tests shall be conducted.

(5) The minimum depth of the soil observations must be to the periodically saturated layer, to the bedrock, or three feet below the proposed depth of the system, whichever is less.

9.6 Each soil profile observed at the proposed soil treatment and dispersal area must be evaluated under adequate light conditions with the soil in a moist unfrozen state for the characteristics in items (1) through (8):

(1) The depth of each soil horizon measured from the ground surface. Soil horizons are differentiated by changes in texture, color, redoximorphic features, bedrock, structure, consistence, and any other characteristics that affects water movement or treatment of effluent.

(2) A description of all soil colors for each horizon according to the Munsell Soil Color Charts, Revised Edition, Munsell Color Corporation (1992), or equivalent. The color charts are incorporated by reference, are available through the Minitex interlibrary loan system, and are not subject to frequent change.

(3) A description of the soil texture, and structure using the United States Department of Agriculture (USDA) soil classification system as specified in the Field Book for Describing and Sampling Soils, which is incorporated by reference under Section 2.2 (46).

(4) Depth to bedrock.

(5) Depth to periodically saturated soil for new construction or replacement as determined by redoximorphic features and other indicators, as determined in subitems (A) to (C):

(A) In subsoil and parent material, redoximorphic features include:

(i) Distinct redoximorphic iron accumulation or distinct redoximorphic iron depletions;

(ii) A gleyed or depleted soil matrix or redoximorphic mottles having a color chroma of two or less or a depleted matrix or redoximorphic mottles having a color hue of 5Y and a chroma of three or less; or

(iii) Faint redoximorphic concentrations or faint redoximorphic depletions in subsoil or parent material with a hue of 7.5YR or redder.

(B) In lower topsoil layers that are deeper than 12 inches from the surface and are immediately followed in depth by a periodically saturated horizon, redoximorphic features include:

(i) Soil colors with a redoximorphic chroma of two or less; or

(ii) Redoximorphic accumulations or depletions.

(C) In the upper 12 inches of the topsoil layer immediately below which occurs a periodically saturated horizon, the depth of seasonal saturation is determined by indicators in units (i) to (v):

(i) Soil colors with a chroma of zero;

(ii) Organic soil textures or mineral soil textures with an organic modifier;

(iii) Dominance of hydrophytic vegetation;

(iv) The soil treatment area at or near the elevation of the ordinary high water level of a surface water or in a concave hill slope position; or

(v) Redoximorphic accumulations or depletions.

(6) Depth to periodically saturated soil for all existing systems, determined by redoximorphic features in item (5), except subitems (B), unit (i), and (C), units (i), (iii), and (iv), as measured outside the area of the system influence in an area of similar soil.

(7) Depth of standing water in the soil observation excavation, measured from the soil surface, if observed.

(8) Any other soil characteristics that needs to be described to design a system, such as hardpans or restrictive layers. These other characteristics must be classified according to the Field Book for Describing and Sampling Soils, which is incorporated by reference under Section 2.2 (46).

9.7 The effluent loading and absorption area size must be determined by either item (1) or (2).

(1) The loading rate based on an examination of soil texture, undisturbed structure, and consistence at the most limiting layer within 12 inches below the proposed absorption area using the United States Department of Agriculture (USDA) soil classification system as specified in the Field Book for Describing and Sampling Soils, which is incorporated by reference under Section 2.2 (46); or

(2) The loading rate based on the percolation procedure described in subitems (A) to (H).

(A) Each test hole must be six to eight inches in diameter, have vertical sides, and be located at the depth of the proposed soil absorption area. For mounds and at-grade systems, the bottom of each test hole must be in the upper 12 inches of the original soil. For trenches and seepage beds, the bottom of each test hole shall be at the depth of the absorption area;

(B) Soil texture descriptions for percolation test holes must note the depths from the ground surface where texture changes occur;

(C) The bottom and sides of the hole must be carefully scratched to remove any smearing and to provide a natural soil surface into which water penetrates. The scarification must not result in the hole having a diameter of greater than eight inches;

(D) All loose material must be removed from the bottom of the test hole and two inches of one-fourth to three-fourths inch gravel or clean sand must be added to protect the bottom from scouring;

(E) The hole must be carefully filled with clear water to a minimum depth of 12 inches from the bottom of the test hole and maintained for no less than four hours for saturation to occur. The soil must then be allowed to swell for at least 16, but no more than 30, hours. In sandy soils, the saturation and swelling procedure is not required and the test is allowed to proceed if the initial filling of the hole with 12 inches of water seeps away in less than ten minutes;

(F) In sandy soils, water depth must be adjusted to eight inches over the soil at the bottom of the test hole. From a fixed reference point, the drop in water level must be measured in inches to the nearest 1/16 inch at approximately ten-minute intervals. A measurement is also allowed to be made by determining the time it takes for the water level to drop one inch from an eight inch reference point. If eight inches of water seeps away in less than ten minutes, a shorter interval between measurements must be used, but water depth must not exceed eight inches. The test must continue until three consecutive percolation rate measurements do not vary by more than ten percent. In other soils, the water depth must be adjusted to eight inches over the soil at the bottom of the test hole. From a fixed reference point, the drop in water level must be measured in inches to the nearest 1/16 inch at approximately 30-minute intervals and refilled between measurements to maintain an eight inch starting head. If water seeps away in less than 30 minutes, a shorter time interval between measurements must be used, but water depth must not exceed eight inches. The test must continue until three consecutive percolation rate measurements do not vary by more than ten percent. The percolation rate is also allowed to be determined by observing the time it takes the water level to drop one inch from an eight-inch reference point if a constant water depth of at least eight inches has been maintained for at least four hours prior to the measurement;

(G) The time interval must be divided in minutes by the drop in water level in inches to obtain the percolation rate in minutes per inch. The percolation rates that are within the ten percent provision determined for each test hole must be averaged to determine the final percolation rate for that hole. The slowest final percolation rate for all holes within the soil dispersal area must be used for design; and

(H) A percolation test must not be run where frost exists within 12 inches of the bottom of the percolation test hole.

9.8 A written report on the site evaluation for an individual subsurface sewage treatment system must be prepared and include the following:

(1) Preliminary and field evaluation results from Sections 9.2 through 9.6.

(2) Dates of preliminary and field evaluations.

(3) A map drawn to scale or dimension, with a north arrow, and including:

(A) horizontal and vertical reference points of the proposed soil treatment and dispersal areas, soil observations, percolation tests, and pertinent distance from the proposed SSTS to all required setbacks, lot improvements, easements, ordinary high water mark of public waters, property lines, and direction and percent slope.

(B) the location of any unsuitable, disturbed, or compacted areas.

(C) the access route for system maintenance.

(4) The estimated depth of periodically saturated soil layer, bedrock, or flood elevation, if appropriate.

(5) The proposed elevation of the bottom of the soil treatment and dispersal system.

(6) Anticipated construction related issues.

(7) The name, address, telephone number, and certified statement of the individual conducting the site evaluation.

(8) An assessment of how known or reasonably foreseeable land use changes are expected to affect system performance, including, but not limited to, changes in drainage patterns, increased impervious surfaces, and proximity of new water supply wells.

(9) A narrative explaining any difficulties encountered during the site evaluation, including, but not limited to, identifying and interpreting soil and landform features and how the difficulties were resolved.

(10) A notation of any differences between observed soil characteristics and those identified in the soil survey report.

9.9 Applicants for subsurface sewage treatment system permits, site approvals or subdivision approvals will be required to submit soil test data from soil borings and percolation tests, or soil pits, for each proposed site or installation. The minimum testing shall be that necessary to verify suitable conditions for two complete soil dispersal and treatment areas.

9.10 All soil testing shall be conducted in accordance with the requirements of this Chapter and shall be conducted by appropriately licensed businesses and certified individuals in accordance with Minnesota Rules, Chapter 7083.

9.11 Prior to and during construction or lot improvements, the proposed initial and replacement soil treatment and dispersal areas shall be protected from disturbance, compaction, or other damage by use of stakes and silt fence or snow fence.

9.12 Underground utilities must be located before soil observations are undertaken. Required safety precautions must be taken before entering soil observation pits.

9.13 Where soil tests require a mound, testing and design must clearly show suitable area for installation of two (2) complete mounds. Where site conditions are such that the only backup mound will likely be disturbed, the Department, at its discretion, may require both mounds to be constructed at once.

9.14 Designs for new construction or replacement SSTS must comply with all applicable requirements and any other applicable codes, rules, and laws.

SECTION 10 MSTS SITE EVALUATION AND SOIL TESTING

10.1 Soil and site evaluations must be conducted for MSTS design. The evaluations must be conducted according to this Section and Section 9 of this Chapter. Evaluations must identify and delineate an initial and replacement soil treatment and dispersal area with appropriate system boundaries.

10.2 A preliminary evaluation for midsized subsurface sewage treatment systems shall consist of determining:

(1) The design flow and anticipated effluent concentrations of biochemical oxygen demand, total suspended solids, and fats, oils, and grease, and inputs of non-domestic waste.

(2) Whether the location of water supply wells impacts the location of the system due to setback constraints.

(3) Whether building improvements will be within 50 feet of the proposed soil treatment and dispersal area.

(4) Whether buried water supply pipes will be within 50 feet of the proposed system.

(5) Whether easements will be within 50 feet of the proposed system.

(6) Whether the ordinary high water level of public waters will be within 500 feet of the proposed soil treatment and dispersal area and if so, a preliminary assessment of phosphorus impacts to the surface water.

(7) Whether the system will be located in a floodplain and the system location in relation to the 100-year flooding elevation from published data if available or data that is acceptable to the Department or local unit of government.

(8) The required setbacks from the proposed soil treatment and dispersal system.

(9) The soil survey information on the proposed soil dispersal area, including the soil map, map units, landscape position, parent material, flooding potential, slope range, periodically saturated soil level, depth to bedrock, texture, color, and structure of soil horizons, and permeability of soil horizons.

(10) A geocode or property identification number.

(11) The names of the property owners; and

(12) The location of the system on a United States Geological Survey quadrangle map of the proposed soil treatment and dispersal area and the area within one mile.

10.3 Before conducting a field evaluation, the designer shall confer with the Department or local unit of government to determine the requirements and scope of the evaluation, dependent upon system size, soil conditions, and other applicable factors. At a minimum, the requirements in this Section must be met:

(1) Property lines must be confirmed in the field using the most recent document source. Site improvements, required setbacks, and easements must be identified, located, and marked.

(2) A general evaluation and description of the proposed soil dispersal area, including a general geomorphic description, current land use, and past land use, if known, must be provided.

(3) The following surface features must be identified and described:

(A) The dominant vegetation.

(B) Evidence of disturbed or compacted soil or flooding or run-on potential.

(C) Landscape position, including landform, slope gradient, slope direction, and surface morphometry as described in the Field Book for Describing and Sampling Soils Version 2.0, September 2002, developed by the National Soil Survey Center and Natural Resources Conservation Service of the United States Department of Agriculture. The field book is incorporated by reference, is not subject to frequent change, and is available through the Minitex interlibrary loan system.

10.4 The required number of soil pits to adequately characterize the soil on the proposed site must be determined by the professional judgment of the designer as based on the size of the area, consistency of the soil, and approved by the Department or local unit of government.

10.5 The qualifying soil observation pits to be used for the MSTS design must be located on or near the borders of the proposed soil treatment and dispersal area. Soil observation pits must be dug outside the soil dispersal area, if possible. The soil must be observed and described to a depth of at least three feet below the proposed depth of the system. Other soil observation pits are allowed to supplement the required soil observation pit information.

10.6 Underground utilities must be located before soil observations are undertaken. Required safety precautions must be taken before entering soil observation pits.

10.7 The following soil observations must be made:

(1) The soil properties and features described in items (A) to (M) must be described according to the Field Book for Describing and Sampling Soils, which is incorporated by reference under Section 2.2 (46).

(A) Matrix soil color.

(B) Soil features that have different colors from the matrix color, including, but not limited to, clay films, organic stains, silt coats, nodules, and concretions.

(C) Abundance, size, color, and contrast of redoximorphic features.

(D) Soil texture, with modifiers.

(E) Grade, size, and shape of soil structure.

(F) Moist soil consistence.

(G) Abundance and size of rock fragments.

(H) Abundance and size of roots.

(I) Horizon boundary conditions.

(J) Parent materials.

(K) Pores, quantity and size.

(L) Quantity of boulders and tree stumps affecting construction.

(M) Any other characteristics of feature that affects permeability of the soil or treatment of sewage effluent.

(2) The depth to bedrock, if encountered, must be determined by the requirements in Section 2.2 (9).

(3) The elevation of standing water evident in any soil pit must be identified.

(4) The soil must not be described when frozen, at improper moisture content, or under poor light conditions.

10.8 Hydraulic conductivity testing of the soil must be employed, along with a determination of the soil's texture, structure and consistence, to determine the loading rate of effluent in the soil. The frequency of observations and measurements must be determined by the professional judgment of the designer, dependent on the variation in soil conditions and the system size, with the frequency of the observations and measurements approved by the Department or local unit of government.

10.9 All field soil information gathered must be compared with soil survey information. Any discrepancies shall be identified.

10.10 Site and soil information gathered in Section 10.2 through Section 10.9 must be interpreted for suitability for MSTS siting, design, and construction, with consideration of the following:

(1) Surface features impacts from precipitation, run-on, and interflow or any other item that could have potential to adversely impact the ability of the soil to accept water.

(2) Cultural features, including, but not limited to, setbacks and easements.

(3) Site conditions affecting system layout, distribution system requirements, and constructability.

(4) Layers of coarse soil textures that affect treatment.

(5) Disturbed, compacted, cut-filled, or other unnatural condition, if present.

(6) The uniformity of the soil over the site.

(7) Future surrounding land use changes.

(8) Soil sizing factor or loading rate.

(9) An approximation of the rise in groundwater from system operations as determined by a groundwater mounding assessment. A narrative evaluation of the accuracy of the approximation must be provided. The approximation must be related to the requirements in Section 16.5 (7).

10.11 Systems proposed to be located in flood fringes must determine feasibility of relocating the system outside the floodplain.

10.12 The limiting layer in the soil shall be determined based on the depth of bedrock or periodically saturated soil if encountered. The depth of periodically saturated soil shall be determined according to Section 9.6 (5), and the depth to bedrock shall be as defined in Section 2.2 (9).

10.13 The proposed soil treatment and dispersal areas shall be protected from disturbance, compaction, or other damage by use of stakes and silt fence or snow fence.

10.14 All information gathered in Section 10.2 through Section 10.12 must be submitted for review and approved by the Department or local unit of government prior to final design. The submittal must also contain:

(1) A map of the proposed soil dispersal area, drawn to scale, showing:

(A) Features with a setback within 150 feet of the system.

(B) Easements within 50 feet of the system.

(C) Floodplains, wetlands, and surface waters, within 100 feet of the system.

(D) Location and elevation of all soil pits, borings, and hydraulic tests.

(E) Two-foot contour lines.

(2) Dates and weather conditions during the field evaluations.

(3) Elevations of the periodically saturated soil or bedrock.

(4) Proposed depths of the system bottom.

(5) Proposed soil loading rate.

(6) System site boundaries.

(7) Anticipated construction related issues.

(8) The name, address, telephone number, and certified statement of the individual conducting the site evaluation.

(9) A narrative explaining any difficulties encountered during the site evaluation, including, but not limited to, identifying and interpreting soil and landform features and how the difficulties were resolved.

SECTION 11 GROUNDWATER INVESTIGATION

11.1 A preliminary groundwater assessment for nitrogen impacts to aquifers must be conducted for all proposed MSTS according to this Section.

11.2 The following information must be ascertained from the best available information:

(1) The size of the soil dispersal system, proposed loading rate, and system geometry.

(2) The geocode(s) or parcel identification number(s) of the parcel(s) where the proposed soil dispersal area is to be located.

(3) Any anticipated discharges from nondomestic sources to the proposed MSTS.

(4) The location of the MSTS on a United States Geological Survey quadrangle topographic map, including the area within a one-mile radius of the proposed soil treatment system.

(5) A determination of the general geology, periodic soil saturation, regional groundwater setting, and aquifers used for water supply and a description of the general site hydrology characteristics, including, but not limited to, identification and estimated depth measurements to geologic units and aquifers, and identification of groundwater confining strata.

(6) A determination whether the proposed system is in a drinking water supply management area, inner wellhead management zone, source water protection area, groundwater sensitive area, or a special well construction area.

(7) An assessment of all water supply wells within a 300-foot radius of the proposed soil treatment area with a minimum assessment of well locations and casing depths from well construction log records. If no records exist, the well locations and casing depths must be estimated.

(8) A determination or estimation of groundwater flow direction

(9) An assessment of pathogenic organism, nitrogen, and phosphorus impacts from the system.

11.3 The designer must consult with the Department or local unit of government to determine whether the Department or local unit of government will require a field or further groundwater investigation and, if so, the extent of the investigation. The field or further investigation must be conducted if information gained in Section 11.2 indicates that a proposed system is a potential contaminant threat to a regional water table, an aquifer, water supply well(s), or surface waters. The threats of concern include, but are not limited to, fecal organism contamination, nitrate contamination, or phosphorus impacts to surface waters.

11.4 The designer must consult with the Department or local unit of government to determine if the Department or local unit of government will require effluent or groundwater monitoring and, if so, the extent of the monitoring. Monitoring must be conducted if information gained in Section 11.2 and 11.3 indicates that a proposed system is a potential contaminant threat to a regional water table, an aquifer, or a water supply well or impacts surface waters. The groundwater mound height must be monitored under all MSTS during operation.

11.5 The information gathered in this part must be used to estimate or measure if the system adequately protects the groundwater and surface water as prescribed in part Section 4.9. The interpretation must include an evaluation of whether contaminant plumes will intersect water supply well capture zones.

11.6 All information required in this part must be submitted for review and approval of the Department or local unit of government prior to final design, including all applicable information delineated on a map.

SECTION 12 SEWAGE FLOW DETERMINATION

12.1 Completion of tasks outlined in Section 12 to Section 21 is considered the second phase of SSTS design.

12.2 The estimated design flow for any dwelling must provide for at least two (2) bedrooms. For multiple or multifamily dwellings, the design flow consists of the sum of the design flows for each individual unit.

12.3 The estimated design flow for dwellings is based on Table I, which is based on calculating the number of bedrooms by 150 gallons per day.

Table I

Number of Bedrooms	Gallons Per Day
2	300
3	450
4	600
5	750
6	900

12.4 The design flow for MSTS serving existing dwellings is determined by the following calculation in conjunction with Section 12.3:

Total flow from the ten highest flow dwellings + (total flow from the remaining dwellings X 0.45)

12.5 For new housing developments, the developer shall determine and restrict the total number of bedrooms for the development and determine the design flow by multiplying the total number of bedrooms by 110 gallons per day. If the ultimate development of phased or segmented growth meets or exceeds 10,000 gallons per day, the initial system or systems and all subsequent systems require a state disposal system permit.

12.6 If construction of additional dwellings or bedrooms, installation of water-using devices, or other factors likely to increase the flow volumes can be reasonably anticipated, the SSTS must be designed to accommodate the additional capacity as determined by the Department or local unit of government.

12.7 Design sewage flow for other establishments are determined by methods in item (1) or (2):

(1) The design flow of sewage for MSTS serving other establishments is estimated using Table II.
(2) The measured design flow of sewage for MSTS serving other establishments is determined by averaging the measured daily flows for a consecutive seven-day period in which the establishment is at maximum capacity or use.

Table II – Estimated Design Sewage Flow from Other Establishments

Dwelling Units (also see outdoor recreation)	Unit	Design Flow (gallons/day/unit)
Hotel or luxury hotel	Guest	55
	Square Foot	0.28
Motel	Guest	38
	Square Foot	0.33
Rooming House	Resident	45
	Add for each non-resident meal	3.3
Daycare (no meals)	Child	19
Daycare (with meals)	Child	23
Dormitory	Person	43
Labor Camp	Person	18
Labor Camp, semi permanent	Person	50
Commercial/Industrial	**Unit**	**Design Flow (gallons/day/unit)**
Retail Store	Square Foot	0.13
	Customer	3.8
	Toilet	590
Shopping Center	Employee	11.5
	Square Foot	0.15
	Parking Space	2.5
Office	Employees/8-Hour Shift	18
	Square Foot	0.18
Medical Office*	Square Foot	1.1
	Practitioner	275
	Patient	8
Industrial Building	Employees/8-Hour Shift	17.5
	Employees/8-Hour Shift with Showers	25
Laundromat	Machine	635
	Load	52.5
	Square Foot	2.6
Barber Shop	Chair	68
Beauty Salon	Station	285
Flea Market	Nonfood vendor/space	15
	Limited food vender/space	25
	With food vendor/space	50
Eating and Drinking Establishments	**Unit**	**Design Flow (gallons/day/unit)**
Restaurant (does not include bar or lounge)	Meal without alcoholic drinks	3.5
	Meal with alcoholic drinks (open 16 hours or less)	8
	Seat (open 16 hours or less)	30
	Seat (open more than 16 hours)	50
	Seat (open 16 hours or less, single service articles)	20
	Seat (open more than 16 hours, single service articles)	35
Restaurant – short order	Customer	7
Restaurant – drive-in	Car Space	30

Eating and Drinking Establishments	Unit	Design Flow (gallons/day/unit)
Restaurant – carry out, including caterers	Square Foot	0.5
Institution Meals	Meal	5.0
Food Outlet	Square Foot	0.2
Dining Hall	Meal	8.5
Coffee Shop	Customer	7
Cafeteria	Customer	2.5
Bar or lounge (no meals)	Customer	4.5
	Seat	36
Entertainment Establishments	**Unit**	**Design Flow (gallons/day/unit)**
Drive-in Theater	Car Stall	5
Theater/Auditorium	Seat	4.5
Bowling Alley	Alley	185
Country Club	Member (no meals)	22
	Member (with meals and showers)	118
	Member (resident)	86
Fairground and Other Similar Gatherings	Visitor	1.5
Stadium	Seat	5
Dance Hall	Person	6
Health Club/Gym	Member	35
Outdoor Recreation and Related Lodging Facilities	**Unit**	**Design Flow (gallons/day/unit)**
Campground	Person with hook-up	36
	Site with hook-up	100
	Site without hook-up, with central bath	62
	Site to be served by dump station	14.5
Permanent Mobile Home	Mobile Home	225
Camp, day without meals	Person	20
Camp, day and night with meals	Person	45
Resort/Lodge Hotel	Person	62
Cabin, resort	Person	50
Retail Resort Store	Customer	4
Park or Swimming Pool	Guest	10
Visitor Center	Visitor	13
Transportation	**Unit**	**Design Flow (gallons/day/unit)**
Gas Station/Convenience Store	Customer	3.5
Service Station*	Customer	11
	Service Bay	50
	Toilet	250
	Square Foot	0.25
Car wash*(does not include car wash water)	Square Foot	5
Airport, Bus Station, Rail Depot	Passenger	5
	Square Foot	5
	Restroom	565

Institutional	Unit	Design Flow (gallons/day/unit)
Hospital*	Bed	220
Mental Health Hospital*	Bed	147
Prison or Jail	Inmate	140
Nursing Home, other adult congregate living	Resident	125
Other Public Institution	Person	105
School (no gym, no cafeteria, and no showers)	Student	14
School (with cafeteria, no gym, and no showers)	Student	18
School (with cafeteria, gym, and showers)	Student	27.5
School (boarding)	Student	95
Church	Seat	4
	Add for each meal prepared	5
Assembly Hall	Seat	4
Miscellaneous	**Unit**	**Design Flow (gallons/day/unit)**
Public Lavatory	User	5
Public Shower	Shower Taken	11

* Waste other than sewage is only allowed to be discharged into the system if the waste is suitable to be discharged to groundwater.

12.8 Unless otherwise noted in Table II, the flow values do not include flows generated by employees. A flow value of 15 gallons per employee per eight hour shift must be added to the flow amount for determining the design flow for other establishments.

12.9 Design flow determination for establishments not listed in Table II shall be determined by the base available information and approved by the Department or by the local unit of government.

12.10 The measured flow of sewage for existing other establishments may be used to modify estimated flow values determined in this part if the length and frequency of the measured flow accurately represents the annual average water use, along with the peak weekly and daily water use.

12.11 The design flow for MSTS must also include 200 gallons of infiltration and inflow per inch of collection pipe diameter per mile per day with a minimum pipe diameter of two inches to be used for the calculation. Flow values are allowed to be further increased if the system employs treatment devices that are exposed to atmospheric conditions that will infiltrate precipitation. Flow estimates as calculated in this Chapter shall not be relied upon for the design of collection systems.

12.12 If concentrations of biochemical oxygen demand, total suspended solids, and oil and grease from the sewage are expected to be higher than 175 mg/L, 65 mg/L, or 25 mg/L, respectively, an estimated or measured average concentration must be determined and be acceptable to the Department or local unit of government. System design must account for concentrations of these constituents so as to not cause internal system malfunction, such as, but not limited to, clogging of pipes, orifices, treatment devices, or media.

SECTION 13 SEWAGE TANKS

13.1 Sewage tanks serving SSTS must meet or exceed the applicable requirements of this Section unless otherwise approved by a Minnesota licensed professional engineer and approved by the Department or the local unit of government.

13.2 Tanks, fittings, risers, and apertures must:

(1) Be capable of supporting long-term vertical loads for the conditions in which the tank will be placed. These loads include, but are not limited to, saturated soil load, based on 130 pounds per cubic foot.

(2) Be capable of withstanding a lateral load for the conditions the tank will be placed.

(3) With proper maintenance and venting, not be subject to failure due to corrosion and degradation from sewage or sewage gases, including risers and maintenance hole covers.

(4) Be structurally capable of withstanding exposure and stresses from freezing conditions.

13.3 Poured in place concrete tanks must be designed to meet each requirement in Section 13.2, and be designed by a Minnesota licensed professional engineer.

13.4 Septic tanks must:

(1) Have a liquid depth of at least 30 inches. Any liquid depth that is greater than 84 inches must not be used when calculating the septic tank liquid capacity.

(2) Have a minimum of six feet between the inlet and outlet of the tank, rather than between compartments, or have a minimum of six feet from the inlet of the first tank to the outlet of the last tank in series.

(3) If site conditions warrant, the inlet and outlet are allowed to be located on walls that are not opposite each other along axis of the maximum dimension; however, the requirements of Section 13.4 (2) must be met.

(4) Have an inlet invert at least two inches above the outlet invert.

(5) Have a reserve or storage space between the liquid surface and the top of the inlet and outlet baffles of not less than eight inches or 100 gallons, whichever is greater.

13.5 For dwellings, there shall be two (2) septic tanks in series with the liquid capacity based on the number of bedrooms in the dwelling; such tanks shall be as large as the capacities in Table III. The only exception to this requirement is for the upgrade of an existing compliant system if the primary tank capacity is met and there is no garbage disposal or sewage pump. System replacement shall require two (2) tanks in series.

Table III – Minimum Septic Tank Capacity

Number of Bedrooms	Tank 1	Tank 2
Two or less	1,000	500
Three	1,000	1,000
Four to Five	1,500	1,000
Six to Seven	2,000	1,000
Eight to Nine	2,500	1,250
Ten or More	Septic tank shall be sized as an MSTS with the second tank in series being at least 50 percent of the capacity of the first tank	
Multiple Family Dwelling containing two or more units	Size shall be the sum of the individual dwelling unit requirements.	

13.6 An effluent screen with an alarm must be installed on the outlet of the last tank in series.

13.7 Septic tanks must be connected in series. Each tank or compartment must contain at least 25 percent of the required total liquid capacity. The first tank must be equal to or larger than any subsequent tank in the series.

13.8 Septic tank liquid capacity prior to other treatment devices must accord with the manufacturer's requirements, accepted engineering principles, or as identified in the product registration recommended standards and criteria.

13.9 If septic tanks are compartmentalized, (1) to (5) of this Section apply:

(1) When septic tanks are divided into compartments, the volume of the first compartment must be equal to or larger than any succeeding compartments. Each compartment must contain at least 25 percent of the total required liquid capacity and have an inside horizontal dimension of at least 24 inches.

(2) Flow between compartments can be achieved by an unbaffled transfer hole with a minimum size of 50 square inches located in the clarified liquid zone or a minimum of 12-square inch transfer hole located above the clarified liquid zone that is baffled according to Section 13.11. The final compartment of a tank that employs a transfer hole in the clarified zone shall not be used as a pump tank.

(3) Septic tanks must have at least a two-inch drop between the invert of the inlet to the invert of the outlet. No liquid level drop is required between two compartments.

(4) Adequate venting must be provided between compartments by baffles or by an opening of at least 12 square inches near the top of the compartment wall.

(5) All compartmental walls must be designed to withstand the weight of the effluent against an empty compartment.

13.10 All septic tanks must be baffled according to (1) to (7) of this Section. Effluent screens are allowed to be substituted for outlet baffles.

(1) Baffles must be installed at each inlet and outlet of septic tanks. Outlet baffles are required on compartment walls if the transfer hole is at the liquid level.

(2) Baffles must be resistant to corrosion or decay. Inlet baffles must not restrict the movement of solids.

(3) Baffles must be integrally cast with the tank or affixed at the top and bottom with connectors that are not subject to corrosion or decay. Baffles for fiberglass reinforced polyester tanks are allowed to be either resin bonded or secured with suitable structural adhesive. Sanitary tees used as baffles must be affixed to the inlet or outlet pipes with a permanent waterproof adhesive.

(4) The inlet baffle must extend at least six inches, but not more than 20 percent of the total liquid depth, below the liquid surface and at least six inches above the liquid surface.

(5) The outlet baffle and any baffles between compartments must extend below the liquid surface a distance equal to 40 percent of the liquid depth, except that the penetration of the indicated baffles or sanitary tees for horizontal cylindrical tanks must be 35 percent of the total liquid depth. They must also extend above the liquid surface as required in Section 13.10 (4).

(6) There must be at least one inch between the underside of the top of the tank and the highest point of the inlet and outlet baffles.

(7) The nearest point on the inlet baffles other than sanitary tees must be no less than 6 inches and no more than 12 inches from the end of the inlet pipe. The nearest point on the outlet baffle, other than sanitary tees, must not be closer than 6 inches and no more than 12 inches from the beginning of the outlet pipe of the baffle. Sanitary tees used as inlet or outlet baffles must be at least 4 inches in diameter.

13.11 Septic tanks shall have a minimum of two maintenance holes with a minimum diameter of 20 inches (least dimension). One maintenance hole must be over the outlet device (baffles or screen). Another maintenance hole must be either above the inlet device, or near the center of the tank, and facilitate pumping without interference. Enough maintenance holes must be provided so access can be gained within six feet of all walls for solids removal of each compartment. Six-inch inspection pipes shall be provided over any baffles that do not have access maintenance holes.

13.12 All maintenance hole risers must extend through the tank cover above final grade.

13.13 Covers for maintenance holes must:

(1) Be secured by being locked, being bolted or screwed, having a weight of at least 95 pounds, or other methods approved by the Department or local unit of government. Covers shall also be leak resistant; and be designed so the cover cannot be slid or flipped, which could allow unauthorized access to the tank.

(2) Have a written and graphic label warning of the hazardous conditions inside the tank.

(3) Be capable of withstanding a load that the cover is anticipated to receive.

(4) Be made of a material suitable for outdoor use and resistant to ultraviolet degradation.

13.14 A secondary method to control unauthorized access must be provided.

13.15 All precast reinforced concrete sewage tanks must be constructed to meet the requirements of this chapter. Information on best practices for tank construction is found in the National Precast Concrete Association's best practices manual, Precast Concrete On-site Wastewater Tanks (2005). This manual is incorporated by

reference, is available through the Minitex interlibrary loan system, and is not subject to frequent change. If a conflict exists between the manual and this chapter, this chapter applies.

13.16 All fiberglass-reinforced polyester and polyethylene tanks must be constructed to meet the requirements of this chapter. Information on best practices for these tanks is found in the International Association of Plumbing and Mechanical Officials (IAPMO), Material and Property Standard for Prefabricated Septic Tanks, Standard PS 1-2006 (2006). This standard is incorporated by reference, is available through the Minitex interlibrary loan system, and is not subject to frequent change. If conflicts exist between the standard and this chapter, this chapter applies.

13.17 Precast reinforced concrete tanks must:

(1) Have a method to lift the tank for an ultimate load that is four times the working load.

(2) Undergo proper curing to achieve a compressive strength of 4,000 pounds per square inch before transport, placement, or use.

(3) Have no pipe penetration points or openings in the exterior walls or tank bottom below the tank liquid level, unless designed for a specific operational purpose and approved by the Department or local unit of government.

13.18 Fiberglass-reinforced polyester or polyethylene tanks must be protected against deterioration during storage.

13.19 Location and installation of tanks:

(1) Sewage tanks must not be placed in areas that prohibit the removal of solids and liquids from the tank according to Section 22.

(2) Sewage tanks must be set back as specified in Table V in Section 16.

(3) The top of sewage tanks must not be buried deeper than four feet from final grade for new dwellings, or the tank manufacturer's maximum designed depth for the tank. The minimum depth of soil cover over the insulation on the top of the tank is six inches.

(4) Sewage tanks must not be placed in floodways, drainageways, or swales. Upslope drainage must be diverted away from the location of all tanks. A tank's final cover must be crowned or sloped to shed surface water.

(5) Sewage tanks must not be placed in areas subject to vehicular traffic unless engineered for the anticipated load.

(6) Sewage tanks must be placed on firm and evenly compacted soil and with the soil level in all directions. The bottom shall be excavated in a manner so the vertical load is borne by the tank walls and not the tank bottom. If the bottom of the tank excavation contains rocks, bedding material must be used according to manufacturer's instructions. The soil beneath the tank must be capable of bearing the weight of the tank and its contents.

(7) Sewage tanks and risers must be installed according to manufacturer's requirements and in a structurally sound and watertight fashion.

(8) If the top of a sewage tank is to be less than two feet from final grade, the lid of the tank must be insulated to an R-value of ten. Maintenance hole covers must be insulated to an R-value of ten. All insulating materials must be resistant to water absorption.

(9) Sewage tanks placed below the level of the periodically saturated soil must employ a method to protect against flotation under periodic saturated soil conditions when the tank is empty.

(10) Connections between the concrete tank and the building sewer or supply pipe must meet the requirements of American Society for Testing and Materials, Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals, ASTM C923 (2002), or equivalent. The standard is incorporated by reference, is available through the Minitex interlibrary loan system, and is not subject to frequent change.

(11) Joints of concrete tanks, concrete tank lids, and concrete risers must be sealed using a bonding compound that meets American Society for Testing and Materials, Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants, ASTM C990 (2003). The standard is incorporated by reference, is available through the Minitex interlibrary loan system, and is not subject to frequent change.

13.20 All septic tanks must be assessed in accordance with Minnesota Rules, Chapter 7080.2010.

13.21 Tanks must be identified in accordance with the following:

(1) Sewage tanks must be marked near the outlet with:

(A) The manufacturer's name.

(B) The model number.

(C) The liquid capacity.

(D) The date of manufacture.

(E) The maximum depth of burial.

(2) The tank manufacturer or manufacturer's agent shall provide the information in Section 13.20 to the installer in writing.

(3) The tank inlet or outlet must be clearly marked.

(4) The installer shall submit the information in Section 13.20 with the as-built drawing.

13.22 Sewage tanks must meet the requirements in parts 7080.1910 to 7080.2020[2] by February 4, 2011. Tanks produced and installed prior to February 4, 2011 must meet the requirements of Minnesota Rules 2005, part 7080.0130.

Sewage Tanks for MSTS

13.23 All holding or treatment tanks or vessels, including lined vessels and grease interceptors serving MSTS, must conform to the applicable requirements of this Section, except as modified in Section 13.23 through 13.27, or as designed by a professional engineer and approved by the Department or local unit of government.

13.24 Septic tank capacity for MSTS or Other Establishments shall be determined by:

(1) Total septic tank liquid capacity for a common tank serving multiple dwellings under gravity flow to the common tank is determined by multiplying the design flow by 3.0.

(2) Total septic tank liquid capacity for a common tank serving multiple dwellings under pressure flow to the common tank is determined by multiplying the design flow by 4.0.

(3) Common multiple septic tanks must be connected in series. Individual tanks connected in series or any compartment of a tank must have a capacity of more than one-fourth of the required to total liquid capacity.

(4) For MSTS that have individual septic tanks at each dwelling, the individual tanks must meet the requirements of Section 13.5.

(5) Total septic tank liquid capacity prior to other treatment devices shall be according to manufacturer's requirements or accepted standards.

(6) Holding tanks serving Other Establishments must provide storage of at least five times the design flow.

(7) Effluent screens must be used on the outlet baffle on the final septic tank or pressure filters must be used in the pump tank if common tanks are employed in series. Alarms must be employed on tanks equipped with effluent screens. Lint filters are recommended if the sewage contains laundry waste.

13.25 For common septic tanks, the liquid depth of septic tanks to determine liquid capacity must be no greater than 84 inches. The length-to-width ratio and the length-to-depth ratio must facilitate settling of solids.

13.26 For common septic tanks, the space in the tank between the liquid surface and the top of the inlet and outlet baffles must not be less than 20 percent of the total required liquid capacity.

13.27 All tanks used for MSTS must be tested for watertightness in accordance with Minnesota Rules, Chapter 7080.2010, Subp. (3). The test shall be conducted to include the watertightness of all connections and risers.

13.28 Liners used as watertight barriers for treatment devices must be designed and constructed according to liner requirements developed by the Commissioner of the Minnesota Pollution Control Agency. If conflicts exist between this Chapter and those requirements, this Chapter applies. Compacted soil liners must not be used as watertight barriers for treatment devices. Liners must be tested and must hold water without loss for 24 hours after being filled to the top of the liner.

13.29 A commercial or institutional food preparation facility such as, but not limited to, a restaurant, cafeteria, or institutional kitchen, served by a system regulated under this Chapter, the system design for which was submitted to the Department or local unit of government after the effective date of this Chapter, shall install an external grease interceptor, unless other grease control measures are taken and approved by the Department or local unit of government.

SECTION 14 DISTRIBUTION OF EFFLUENT

14.1 Distribution of effluent for SSTS must meet or exceed the requirements of this Section and Minnesota Rules, Chapter 7080.2050[3].

14.2 The supply pipe extending from the septic tank to the undisturbed soil beyond the tank excavation must meet the strength requirements of American Society for Testing and Materials (ASTM), Schedule 40 Pipe, contained in Standard Specifications for Poly(Vinyl Chloride)(PVC) Plastic Pipe, Schedule 40, 80, 120, ASTM D1785 (2006). The schedule is incorporated by reference, is available through the Minitex interlibrary loan system, and is not subject to frequent change.

14.3 Supply pipes must:

(1) Be made from materials resistant to breakdown from sewage and soil.

(2) Be watertight, including all joints.

(3) Be durable throughout the design life.

(4) Not deflect, buckle, crush, or longitudinally bend.

(5) Be resistant to pressures, fatigue, and strain for the application.

(6) Be installed according to American Society for Testing and Materials, Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications, ASTM D2321 (2005). The standard is incorporated by reference, is available through the Minitex interlibrary loan system, and is not subject to frequent change.

(7) Be designed, installed, and protected to minimize the danger of freezing in the pipe.

(8) Not be closer than six inches from final grade. Pipes susceptible to freezing shall be insulated.

(9) Be setback from the water supply wells and water service pipes according to Minnesota Rules, Chapters 4715 and 4725.

14.4 The minimum slope for gravity supply pipes is one percent (⅛-inch per linear foot). There is no maximum slope. Pipe restraints must be used for slopes greater than 20 percent or where fluid velocities in the pipe exceed 15 feet per second. For pressure systems, a minimum slope of one percent for drainback or other frost protection measures must be employed.

14.5 Access to each supply pipe must be provided for cleanout. The access point must be accessible from final grade.

14.6 Gravity Distribution

(1) Serial distribution must be used to distribute effluent to individual trenches in a soil treatment and dispersal system. If the necessary elevation differences between trenches for serial distribution cannot be achieved by natural topography or by varying the excavation depths, parallel distribution can be used. Serial distribution must not create a pressure head on trenches at lower elevations.

(2) If drop boxes are used for serial distribution, Subitems (A) to (F) apply.

(A) The drop box must be watertight and constructed of durable materials not subject to corrosion or decay.

(B) The invert of the inlet supply pipe must be at least one inch higher than the invert of the outlet supply pipe to the next drop box.

(C) The invert of the outlet supply pipe to the next drop box must be no greater than two inches higher than the crown of the distribution pipe serving the trench in which the box is located.

(D) When sewage tank effluent is delivered to the drop box by a pump, the pump discharge must be directed against a wall or side of the box on which there is no outlet or directed against a deflection wall, baffle, or other energy dissipater. The discharge rate into the drop box must not result in surfacing of sewage from the drop box. The supply pipe must drain after the pump shuts off.

(E) The drop box must be covered by a minimum of six inches of soil. If the top of the box is deeper than six inches, access must be provided above, at, or within six inches of finished grade.

(F) The drop box must be placed on firm and settled soil.

(3) If valve boxes are used, all requirements in Section 14.6 (2) apply.

(4) Distribution boxes must meet the standards in items (A) to (F).

(A) The box must be watertight and constructed of durable materials not subject to corrosion or decay.

(B) The distribution box must be covered by a minimum of six inches of soil. If the top of the box is deeper than six inches, access must be provided above, at, or within six inches of the finished grade.

(C) The inverts of all outlets must be set and maintained at the same elevation.

(D) The inlet invert must be either at least one inch above the outlet invert or sloped such that an equivalent elevation above the outlet invert is obtained within the last eight feet of the inlet pipe.

(E) Each trench line must be connected separately to the distribution box and must not be subdivided. Distribution boxes must not be connected to one another if each box has distribution pipes.

(F) When sewage tank effluent is delivered by pump, a baffle wall must be installed in the distribution box or the pump discharge must be directed against a wall, baffle, side of the box on which there is no outlet, or directed against a deflection wall, baffle, or other energy dissipater. The baffle must be secured to the box and extend at least one inch above the crown of the inlet pipe. The discharge rate into the drop box must not result in surfacing of sewage from the drop box. Pressure must not build up in the box during pump discharge.

(5) Nonpressurized distribution pipes must meet the requirements of items (1) to (4) below and Section 14.3 (1) and Section 14.3 (3) to Section 14.3 (5).

(1) Distribution pipes used for gravity distribution must be at least four inches in diameter.

(2) Distribution pipes used for gravity distribution must have at least one row of holes of no less than one-half inch in diameter spaced no more than 40 inches apart.

(3) Distribution pipes for gravity distribution must be laid level or on a uniform slope oriented away from the distribution device of no more than four inches per 100 feet.

(4) Distribution pipes for gravity distribution in seepage beds must be uniformly spaced no more than five feet apart and not more than 30 inches from the side walls of the seepage bed.

14.7 Pressure Distribution

(1) Pressure distribution must pressurize the entire distribution system and must be used for:

(A) Mound systems.

(B) At-grade systems.

(C) All trenches and seepage beds in accordance with Minnesota Rules, Chapter 7080[5].

(D) All seepage beds with a width greater than 12 feet

(E) New construction or replacement systems receiving treatment Level A or Level B effluent, as determined in Minnesota Rules, 7083.4030, Table III.

(F) All systems where the distribution network is installed above the original grade.

(G) All MSTS.

(2) Pressurized distribution pipes must conform to the requirements of Section 14.3 (1) and Section 14.3 (3) to Section 14.3 (5).

(3) Pressure distribution pipes and associated fittings must be properly joined together. The pipe and connections must be able to withstand a pressure of at least 40 pounds per square inch.

(4) The distribution network must be designed so there is less than a ten percent variance in flow for all perforations.

(5) Perforations must be no smaller than⅛ -inch diameter and no larger than ¼-inch diameter. The number of perforations, perforation spacing, and pipe size for pressure distribution must be in accordance with Table IV below. The friction loss in any individual perforated lateral must not exceed 20 percent of the average pressure head on the perforations.

Table IV – Maximum Number of Perforations Per Lateral

1/4-Inch Holes					
Perforation Spacing	Pipe Diameter (Inches)				
	1	1¼	1½	2	3
2.0	10	13	18	30	60
2.5	8	12	16	28	54
3.0	8	12	16	25	52
7/32-Inch Holes					
Perforation Spacing	Pipe Diameter (Inches)				
	1	1¼	1½	2	3
2.0	11	16	21	34	68
2.5	10	14	20	32	64
3.0	9	14	19	30	60
3/16-Inch Holes					
Perforation Spacing	Pipe Diameter (Inches)				
	1	1¼	1½	2	3
2.0	12	18	26	46	87
2.5	12	17	24	40	80
3.0	12	16	22	37	75
1/8-Inch Holes					
Perforation Spacing	Pipe Diameter (Inches)				
	1	1¼	1½	2	3
2.0	21	33	44	74	149
2.5	20	30	41	69	135
3.0	20	29	38	64	128

(6) Perforation holes must be drilled straight into the pipe and not at an angle. Pressurized distribution laterals must be installed level. Perforation holes must be free of burrs. Holes must be spaced no more than three feet apart. A method to introduce air into the pipe after dosing must be provided. The pipes must completely drain after the pump turns off.

(7) Pressure distribution laterals must be spaced no further than 36 inches apart in seepage beds and mound absorption beds, and no further than 24 inches from the outside edge of the bed.

(8) Pressure distribution laterals must be connected to a header or manifold pipe that is of a diameter such that the friction loss in the header or manifold will be no greater than five percent of the average head at the perforations. The header of manifold pipe must be connected to the supply pipe from the pump.

(9) Perforated laterals must not be installed closer than 12 inches from the edges of the absorption bed and perforated laterals must terminate no closer than 12 inches from the ends of the absorption bed.

(10) Pressure distribution cleanouts must be provided to check the system for proper operation and cleaning of plugged perforations. Cleanouts must be accessible from final grade.

(11) Existing systems with gravity distribution which are retrofitted with an advanced treatment device meeting treatment level A or B in Minnesota Rules 7083.4030, must monitor the system to determine the presence of even distribution over the absorption area. If even distribution is not occurring, pressure distribution must be employed.

14.8 For MSTS, distribution of effluent into a soil treatment and dispersal area must comply with all parts of Section 14.

14.9 MSTS must be designed by a registered professional engineer and approved by the Department or local unit of government.

14.10 MSTS must employ pressure distribution.

14.11 The distribution system for MSTS must be designed to dose and rest zones in accordance with operational requirements.

SECTION 15 DOSING OF EFFLUENT

15.1 When pumping or dosing is necessary, it must comply with this Section.

15.2 Pump tanks shall meet or exceed the requirements of Section 13.2, Sections 13.11 through Section 13.20. All dosing chambers must be vented. Pump tanks shall have a maintenance hole with a minimum diameter of 20 inches (least dimension) which allows access and removal of any plumbing or other device. These maintenance holes shall meet or exceed the requirements of Section 13.12 and Section 13.13 of this Chapter.

15.3 The pump, pump controls, and pump discharge line must be installed to allow access for servicing or replacement without entering the pump tank.

15.4 The pump tank must either include:

(1) An alternating two-pump system; or

(2) Have a minimum total capacity of:

(A) 500 gallons for design flows of 600 gallons per day or less; or

(B) 100 percent of the design flow for design flow values of greater than 600 gallons per day.

(3) MSTS and Other Establishments must include an alternating two-pump system and have a minimum capacity of 50 percent of the design flow.

15.5 An SSTS with a pump must employ an alarm device to warn of failure.

15.6 The inlet of pumps must be elevated at least four inches from the bottom of the pump tank or protected in some other manner to prevent the pump from drawing excessive settled solids.

15.7 Electrical installations must comply with applicable laws and ordinances including the most current codes, rules, and regulations of public authorities having jurisdiction and with Minnesota Rule, Chapter 1315.0200, which incorporates the National Electrical Code.

15.8 If a pump is used to lift effluent into a gravity distribution system, the following apply:

(1) The pump must discharge at least 10 gallons per minute but no more than 45 gallons per minute.

(2) The pump must be constructed and fitted with sound, durable, and corrosion-resistant materials.

(3) The pump must have sufficient dynamic head for both the elevation difference and friction loss.

15.9 Pumps used for pressure distribution must meet the following requirements:

(1) Pumps must be constructed and fitted with sound, durable, and corrosion-resistant materials.

(2) The pump discharge capacity must be based on the perforation discharges for a minimum average head of:

(A) 1.0 foot for ¼-inch and 3/16-inch perforations for dwellings;

(B) 2.0 feet for 1/8-inch perforations for dwellings

(C) 2.0 feet for ¼-inch and 3/16-inch perforations for MSTS and other establishments; and,

(D) 5.0 feet for 1/8-inch perforations for MSTS and other establishments.

(3) Perforation discharge is determined by the following formula:

$$\mathbf{Q = 19.65\ cd^2h^{1/2}}$$

Where: Q = Discharge in Gallons Per Minute (GPM)
c = 0.6- = coefficient of discharge
d = perforation diameter in inches
h = head in feet

15.10 The pump discharge head must be at least five feet greater than the head required to overcome pipe friction losses and the elevation difference between the pump and the distribution device.

15.11 The quantity of effluent delivered for each pump cycle must be no greater than 25 percent of the design flow and at least five times the volume of the distribution pipes plus one volume of the supply pipe.

SECTION 16 TREATMENT AND DISPERSAL

16.1 Treatment and dispersal of all sewage for new construction or replacement SSTS must in compliance with this Section and Section 17 to Section 21.

16.2 All new construction or replacement SSTS must be designed to meet or exceed the following provisions:

(1) All treatment and dispersal methods must be designed to conform to all applicable federal, state, and local regulations.

(2) Treatment and dispersal processes must prevent sewage or sewage effluent contact with humans, insects, or vermin.

(3) Treatment and dispersal of sewage or sewage effluent must be in a safe manner that adequately protects from physical injury or harm.

(4) An unsaturated zone in the soil must be maintained between the bottom of the soil treatment and dispersal system and the periodically saturated soil or bedrock during loading of effluent.

(5) Soil treatment and dispersal systems must not be designed in floodways. Soil treatment and dispersal systems installed in flood fringes must meet the requirements of Section 18.3. All soil treatment systems located in areas subject to excessive run-on must have a diversion constructed upslope from the system.

(6) SSTS components must be setback in accordance with Table V.

(7) No component of an SSTS is allowed to be located under or within the structure or other impermeable surface.

(8) Flow measurement must be employed for all single family dwellings and other establishments with a pump tank, all single family dwellings with a Type III, IV, V systems, and all multi-family dwellings.

Table V – Minimum Setback Distances (Feet)

Feature	Sewage Tank	Soil Treatment and Dispersal Area
Water supply wells less than 50 feet deep and not encountering at least 10 feet of impervious material	50	100
Any other water supply well or buried suction pipe	50	50
Buried pipe distributing water under pressure	10	10
Occupied buildings and buildings with basements or crawl spaces	10	20
Non-occupied structures	5	10
Property lines	10	10
Above ground and in-ground swimming pools	10	10
The Ordinary High Water Mark of:		
Natural Environment Lakes and Streams	150	150
Recreational Development Lakes and Streams	75	75
General Development Lakes and Streams	75	75
All unclassified waters	75	75
St. Croix River-Rural Districts	150	150
St. Croix River-Urban Districts	100	100
Blufflines:		
St. Croix River Blufflines	40	40
Shoreland Blufflines	20	20

16.3 The following items are required for specific designs as determined in Section 17 to Section 21.

(1) Employ components registered under Minnesota Rules 7083.4070 and 7083.4080 that are installed, used and operated according to the conditions placed on the registration.

(2) Employee structural components and joint sealants that meet or exceed the system's expected design life.

(3) For acceptable treatment of septic tank effluent by soil, the soil treatment and dispersal systems must meet the following requirements:

(A) A minimum three-foot vertical soil treatment and dispersal zone shall be designed below the distribution media that meets the following criteria:

(i) The zone must be above the periodically saturated soil and bedrock. The zone must be continuous and not be interrupted by seasonal zones of saturation.

(ii) Any soil layers with a texture group of 1 in Table IX in Minnesota Rules, Chapter 7080.2150[1] must not be credited as part of the necessary three-foot zone.

(iii) The entire treatment zone depth must be within seven feet from final grade.

(B) The distribution system or media must not place a hydraulic head greater than 30 inches above the bottom of the absorption area.

(4) The system's absorption area must be in original soil.

(5) The system's absorption area must be sized according to the Table IX-Loading Rate for Determining Bottom Absorption Area for Trenches and Seepage Beds for Effluent Treatment Level C and Absorption Ratios for Determining Mound Absorption Areas Using Detailed Soil Descriptions as found in Minnesota Rules, Chapter 7080.2150[1], or by using Table VI if not using detailed soil descriptions. Soils with a loading rate less than 0.45 gallons per day per square foot cannot be used in a Type I or Type II system for new construction.

Table VI

Loading Rates for Determining Bottom Absorption Area for Trenches and Seepage Beds for Effluent Treatment Level C and Absorption Ratios for Determining Mound Absorption Areas using Percolation Tests

Percolation Rate (Minutes Per Inch)	Soil Loading Rate (gpd/ft^2)	Mound Absorption Ratio
<0.1*	-	-
0.1 – 5*	1.20	1
0.1 – 5 (Soil Texture Group 3)	0.6	2
6 – 15	0.78	1.3
16 – 30	0.6	2
31 – 45	0.5	2.4
46 – 60	0.45	2.6
>60**	0.24	5.0

* See Section 18.2 for a system with this type of soil (Type II, Rapidly Permeable Soils Systems)

** Soil with too high a percentage of clay for installation of a Type I, or Type II system. Systems in soils with this Percolation Rate must be a Type III, Type IV or Type V system.

(6) If drainfield rock medium is employed, a durable, nonwoven geotextile fabric must be used to cover the distribution rock medium. The fabric must be of sufficient strength to undergo installation without rupture. The fabric must permit passage of water without passage of overlying soil material into the rock medium.

(7) All excavation into the absorption area, or surface preparation of the upper 12 inches of the absorption area, must be in a manner to expose the original soil structure in an unsmeared and uncompacted condition. Excavation is only allowed when the soil moisture content is at or less than the plastic limit and is not frozen or freezing.

(8) Excavation equipment or other vehicles must not be driven on the excavated or prepared absorption area. Foot traffic on these areas must be minimized and not cause compaction. The exposed areas must be immediately covered with the media or designed coverage materials. If the areas are exposed to direct rainfall, they must be allowed to dry and must be re-prepared according to Section 16.3 (7).

(9) A minimum of six inches of topsoil borrow shall be placed over the system.

(10) A close-growing, vigorous vegetative cover must be established over the soil treatment and dispersal system and other vegetatively disturbed areas. The sodding, seeding, or vegetation establishment shall begin immediately after the placement of the topsoil borrow. The soil treatment and dispersal system must be protected from erosion and excessive frost until a vegetative cover is established. The vegetative cover established must not interfere with the hydraulic performance of

the system and shall provide adequate frost and erosion protection. Trees, shrubs, deep-rooted plants, or hydrophytic plants must not be planted on the system.

16.4 At a minimum, systems designed under this Chapter with a design flow of greater than 2,500 gallons per day, which impact water quality of an aquifer, as defined in Minnesota Rules, Chapter 4725.0100, subpart 21, must employ best management practices for nitrogen reduction developed by the Commissioner to mitigate water quality impacts to groundwater.

16.5 Final treatment and dispersal for MSTS shall meet the following requirements:

(1) Final treatment and dispersal must be according to applicable design requirements of this Chapter, except as modified in this Section. Code of Federal Regulations, Title 40, Parts 144 and 146, prescribe additional design regulations applicable to certain systems. At a minimum, flow amounts to be used for the purpose of this Section must be derived from Table II in Section 12 of this Chapter.

(2) MSTS must meet all setbacks in Table V.

(3) The site proposed to support the soil treatment and dispersal system must:

(A) Have the upper 18 inches of the absorption area:

(i) Be original soil.

(ii) Have a soil loading rate of greater than zero as listed in Table IX in Minnesota Rules, Chapter 7080.2150[1] or Table VI, in Section 16.3.

(iii) Be above the periodically saturated soil or bedrock.

(B) Meet the area size requirements in Section 16.5 (5) and Setbacks in Table V.

(C) Not be a wetland or floodway.

(D) Not be in an area in which surface runoff from precipitation will concentrate (concave hillslope).

(E) Allow the system to be placed on contour.

(4) Inspection pipes must be located to adequately assess the hydraulic performance of the entire soil dispersal system.

(5) Effluent loading rates to the soil shall be no greater than loading rates prescribed in:

(A) Table IX in Minnesota Rules, Chapter 7080.2150[1], or Table VI in Section 16.3, if the absorption area receives treatment level C effluent as defined in Minnesota Rules 7083.4030.

(B) Table XII in Minnesota Rules, Chapter 7080.2350[4], or Table X in Section 20.5, if the absorption area receives treatment level A or B effluent in part Minnesota Rules, 7083.4030.

(C) Section 21.

(6) If the absorption area receives effluent as described in Section 16.5 (5)(A), the absorption area shall be increased by 50 percent of the amount derived in Section 16.5 (5)(A), and zoned for dosing and resting.

(7) The system geometry and lawn area sizing shall be sized to prevent groundwater mounding from violating the unsaturated zone beneath the soil system according to Section 16.5 (8) for proper hydraulic functioning, and for concentration reduction of nitrogen and phosphorus, if applicable.

(8) Additional set-aside land area of 100 percent of the size determined in Section 16.5 (7) is required for systems whose absorption area receives effluent meeting treatment level A or B in part Minnesota Rules, 7083.4030 or designed in accordance with Section 21. Additional land area of 50 percent of the size determined in Section 16.5 (7) is required for systems whose absorption area receives treatment level C in part Minnesota Rules, 7083.4030. The reserve land area must be identified and protected for future use if necessary. Replacement MSTS proposed on sites that cannot meet this requirement are allowed to be exempted by the Department or local unit of government.

(9) For treatment of effluent by soil to meet the performance criteria in Section 4.9 (3) of this Chapter, the soil treatment and dispersal systems must meet the requirements below:

(A) For soil treatment and dispersal systems that receive treatment level C effluent as described in Minnesota Rules, 7083.4030, the soil treatment zone requirements must meet or exceed the requirements of Section 16.3 (3). The required three-foot vertical separation must be maintained during operation after accounting for groundwater mounding.

(B) For soil treatment and dispersal systems that receive treatment level A or B effluent as described in Minnesota Rules, 7083.4030, the soil treatment requirements must meet or exceed the following requirements:

(i) A minimum vertical depth of the soil treatment and dispersal zone below the distribution media shall be determined according to Table IX in Section 20, with a minimum vertical separation of two feet. This zone shall meet the following criteria:

a. The zone must be above the periodically saturated soil and bedrock. The zone must be continuous and not be interrupted by seasonal zones of saturation.

b. Any soil layers with a texture group of I in Table IX in Minnesota Rules, Chapter 7080.2150[1] must not be credited as part of the necessary treatment zone.

c. The entire treatment zone depth must be within seven feet from final grade.

(ii) The distribution system or media must not place a hydraulic head greater than 30 inches above the bottom of the absorption area.

(iii) The system's absorption area must be original soil.

(iv) The systems absorption area must be sized according to Section 16.5 (5).

(C) The minimum vertical separation can be determined by the method described in Section 21 to meet provisions of Section 4.9 (3).

(D) An observation well to measure the height of the periodically saturated soil beneath the operating system must be installed and monitored according to the operating permit.

(10) MSTS systems must employ nitrogen mitigation methods to achieve compliance with Section 4.9 (4), and must be monitored in accordance with Section 11.4 of this Chapter.

(11) Phosphorus mitigation methods must be employed to achieve compliance with Section 4.9 (5), if natural processes are found inadequate.

(12) All information required in this Section shall be submitted for review and approval by the Department or local unit of government prior to system construction, including all applicable information delineated on a map.

16.6 MSTS construction must be according to applicable construction requirements of this Chapter.

16.7 The design standards for new construction or replacement MSTS are provided to meet many of the public health and environmental outcomes in Section 4. In some cases, specific design methods must be employed in addition to the standards provided in this Chapter.

16.8 MSTS must not receive storm water or other sources of clean water.

16.9 All structural components of the system and sealants must be designed to operate throughout the system's design life.

16.10 A flow measure device must be employed on all MSTS.

16.11 The system must be designed with sufficient access and ports to monitor the system as applicable.

16.12 MSTS must employ components registered under parts 7083.4000 to 7083.4110 or have sufficient regulatory oversight in the operating permit.

16.13 The MSTS designer must observe critical periods of the system construction. The designer shall prepare a report of observed construction activities and submit the report to the Department or local unit of government prior to the final inspection.

SECTION 17 TYPE I SYSTEMS

17.1 Systems designed according to this Section are considered Type I Systems. Systems in soils with a loading rate less than 0.45 gallons per day per square foot cannot be used in a Type I system for new construction.

17.2 Trenches and Seepage Beds

(1) To qualify as a trench or seepage bed system, the system must meet or exceed the following requirements:

(A) Employ flow values in Section 12.

(B) Meet or exceed applicable technical requirements of Section 13, Section 14, and Section 15.

(C) Meet or exceed the requirements of Sections 16.2 and 16.3.

(D) Meet the requirements of Section 17.2 (2) to Section 17.2 (15).

(2) Seepage bed placement must be limited to areas having natural slopes of less than six (6) percent. Absorption areas for seepage beds must not be placed in soils with a texture group of 8 on Table IX in Minnesota Rules, Chapter 7080.2150[1]. Seepage beds must not be located in floodplains.

(3) The trench bottom absorption area is calculated by dividing the design flow by the appropriate soil loading rate in Table IX in Minnesota Rules, Chapter 7080.2150[1] or Table VI.

(4) If gravity distribution is used in seepage beds, the seepage bed absorption area is calculated by dividing the design flow by the soil loading rate and then multiplying that value by 1.5.

(5) If pressure distribution is used in seepage beds, the seepage bed absorption area is determined by dividing the design flow by the soil loading rate in Table IX in Minnesota Rules, Chapter 7080.2150[1] or Table VI.

(6) The minimum sidewall absorption is six (6) inches. The bottom absorption area is allowed to be reduced, for gravity distribution trenches only, by the following:

Sidewall Absorption-Inches	Sizing Equivalent
8-11	7%
12-17	20%
18-23	34%
24	40%

(7) Trenches must be no more than 36 inches wide. Any excavation wider than 36 inches shall be considered a seepage bed.

(8) A seepage bed must not be wider than 12 feet if gravity distribution is used.

(9) A seepage bed must not be wider than 25 feet if pressure distribution is used.

(10) Natural, undisturbed soil must exist between multiple trenches and seepage beds.

(11) Multiple seepage beds must be spaced at one-half the bed width. Multiple units must be designed based on contour loading rates as described in Section 2.2 (22) and Section 17.3 (9).

(12) A vertical inspection pipe at least four inches in diameter must be installed and secured in the distribution medium of every trench and seepage bed. The inspection pipe must be located at an end opposite from where the sewage tank effluent enters the medium. The inspection pipe must have three-eighths inch or larger perforations spaced vertically no more than six inches apart. At least two perforations must be located in the distribution medium. Perforations must not be located above the geotextile cover or wrap. The inspection pipe must extend to the bottom of the distribution medium, be secured, and be capped flush with or above finished grade.

(13) The top and bottom of the distribution medium must be level along the contour. Sidewalls must be as vertical as practical and not intentionally sloped.

(14) The minimum depth of soil cover, including topsoil borrow, over the distribution medium is 12 inches.

(15) Trenches or seepage beds must be backfilled and crowned above finished grade to allow for settling. The top six inches of the backfill must have the same texture as the adjacent soil.

17.3 Mounds

(1) To qualify as a mound system, the system must meet or exceed the following requirements:

(A) Employ flow values in Section 12.

(B) Meet or exceed applicable technical requirements of Section 13, Section 14, and Section 15.

(C) Meet or exceed the requirements of Sections 16.2 and 16.3.

(D) Meet the requirements of Section 17.3 (2) to Section 17.3 (30).

Location of Mounds

(2) The upper 18 inches of the original soil mound absorption area must have a minimum loading rate of 0.45 gallons per day per square foot and a mound absorption ratio greater than zero, but no more than 2.6 in Table IX in Minnesota Rules, Chapter 7080.2150[1] or Table VI. The upper 18 inches of the absorption area must also be above the periodically saturated soil or bedrock.

(3) For previously developed sites, the upper 12 inches of the original soil mound absorption area must have a mound absorption ratio of greater than zero in Table IX in Minnesota Rules, Chapter 7080.2150[1] or Table VI. The upper 12 inches of the absorption area must also be above the periodically saturated soil or bedrock.

(4) Setbacks must be according to Table V. Setbacks must be measured from the original soil absorption area.

(5) On slopes of one percent or greater and where the original soil mound absorption ratio is 2.6 or greater in Table IX in Minnesota Rules, Chapter 7080.2150[1] or Table VI, mounds must not be

located where the ground surface contour lines that lie directly below the long axis of the distribution media bed represent a swale or draw, unless the contour lines have a radius of curvature greater than 100 feet. In no case shall mounds be placed on slopes greater than 12 percent.

(6) Mounds must never be located in swales or draws where the radius of curvature of the contour lines is less than 50 feet.

Mound Design and Construction

(7) The mound distribution media bed area consists of bottom area only and must be calculated by dividing the design flow by 1.0 gallons per square foot per day.

(8) The mound distribution media bed area must be as long and narrow as practical. Mound distribution media beds must be no wider than ten feet.

(9) Mound distribution bed length and width must be determined by the contour loading rate, which is the relationship between the vertical and horizontal water movement based on the following soil conditions:

(A) The permeability difference between the original soil mound absorption area and slower permeability horizons below the original soil mound absorption area.

(B) The depth between the original soil mound absorption area and the change in permeability described in Subitem (A).

(C) The land slope.

(10) Clean sand must be used to elevate the mound distribution media bed and must consist of sound, durable material that conforms to the following requirements:

Sieve Size	Percent Passing
No. 4	95-100
No. 8	80-100
No. 10	0-100
No. 40	0-100
No. 60	0-40
No. 200	0-5

Clean sand must also contain less than three percent deleterious substances and be free of organic impurities.

(11) The original soil mound absorption area is determined by multiplying the original soil mound absorption length by the original soil mound absorption width. The original soil absorption width is calculated by multiplying the mound distribution media bed width by the mound absorption ratio. The mound absorption ratio of the upper 18 inches of soil for new construction, or 12 inches of soil for previously developed sites, in the proposed original soil mound absorption area shall be determined according to Table IX in Minnesota Rules, Chapter 7080.2150[1] or Table VI.

(12) The required original soil absorption width for mounds constructed on slopes from zero to one percent must be centered under the mound distribution media bed width. The required original mound soil absorption width constructed on slopes greater than one percent must be measured

downslope from the upslope edge of the mound distribution media bed width and measured in the direction of the original land slope and perpendicular to the original contours.

(13) The side slopes on the mound must no be steeper than three horizontal units to one vertical unit and shall extend beyond the required absorption area, if necessary.

(14) Distribution of effluent over the mound distribution media bed must be by level perforated pipe under pressure according to Section 14 and Section 15.

(15) The supply pipe from the pump to the original soil absorption area must be installed before surface preparation of the original mound soil absorption area. The trench excavated for the supply pipe must be carefully backfilled and compacted to prevent seepage of effluent.

(16) Vegetation in excess of two inches in length and dead organic debris including leaf mats must be removed from the original soil mound absorption area. Trees must be cut nearly flush with the ground and stumps must not be removed.

(17) The original soil mound absorption area must be roughened by backhoe teeth, moldboard, or chisel plow. The soil must be roughened to a depth of eight inches. Discing is allowed if the upper eight inches of soil has a texture of sandy loam or coarser. If plowed, furrows must be thrown uphill and there must not be a dead furrow in the original soil mound absorption area. A rubber tired tractor is allowed for plowing or discing. Rototilling or pulverizing the soil is not allowed. The original soil must not be excavated or moved more than one foot from its original location during soil surface preparation.

(18) All surface preparation must take place when the upper 12 inches of soil has a moisture content of less than the plastic limit and soil conditions allow field testing of soil properties and these properties are maintained throughout the installation.

(19) Prior to placement of six inches of clean sand, vehicles must not be driven on the original soil mound absorption area before or after the surface preparation is completed. The clean sand must immediately be placed on the prepared surface.

(20) If rainfall occurs on the prepared surface, the site must be allowed to dry below the plastic limit and roughened as described in Section 17.3 (17).

(21) The clean sand must be placed by using a construction technique that minimizes compaction. If the clean sand is driven on for construction, a crawler or track-type tractor must be used. At least six inches of sand must be kept beneath equipment to minimize compaction of the prepared surface.

(22) A minimum of 12 inches of clean sand must be placed in contact with the bottom area of the mound distribution media bed and must be uniformly tapered to cover the entire original soil absorption area. Other sandy materials are allowed to be used outside of this area to complete construction of the mound.

(23) The top of the clean sand layer upon which the mound distribution media bed is placed must be level in all directions.

(24) A vertical inspection pipe at least four inches in diameter must be installed and secured at the distribution medium and sand interface. The inspection pipe must have three-eighths inch or larger perforations spaced vertically no more than six inches apart. At least two perforations must be located in the distribution medium. Perforations must not be located above the permeable synthetic

fabric, if used. The inspection pipe must extend to the bottom of the distribution medium, be secured, and be capped, flush with or above finished grade.

(25) On slopes of one percent or greater, the upslope edge of the mound absorption bed must be placed on the contour.

(26) The sidewalls of the mound absorption bed must be as vertical as practical and not intentionally sloped.

(27) A minimum of six inches of sand, sandy loam or loam material must be placed on the top of the mound absorption bed and sloped upwards towards the center of the mound a minimum of ten horizontal units to one vertical unit.

(28) Construction vehicles must not be allowed on the distribution media until backfill is placed as described in Section 17.3 (27).

(29) A minimum of six inches of topsoil borrow must be placed over the entire mound.

(30) A vegetative cover must be established over the entire area of the mound. The mound shall be protected until a vegetative cover is established by use of erosion control. The established vegetative cover shall not interfere with the hydraulic performance of the system and shall provide adequate frost and erosion protection.

17.4 At-Grade Systems

(1) To qualify as an at-grade system, the system must meet or exceed the following requirements:

(A) Employ flow values in Section 12.

(B) Meet or exceed applicable technical requirements of Section 13, Section 14, and Section 15.

(C) Meet or exceed the requirements of Sections 16.2 and 16.3.

(D) Meet the requirements of Section 17.4 (2) to Section 17.4 (14).

(2) The upper 12 inches of the absorption area must have a loading rate of 0.45 gallons per day per square foot or greater as shown in Table IX in Minnesota Rules, Chapter 7080.2150[1] or Table VI.

(3) At-grade systems must not be installed in areas with slopes greater than 12 percent.

(4) Setbacks must be according to Table V. Setbacks must be measured from the original soil absorption area.

Design and Construction of At-Grade Systems

(5) The at-grade absorption width must be as long and narrow as practical. The at-grade absorption width must not exceed a width of 15 feet. The at-grade absorption widths must be determined by the contour loading rate, which is the relationship between the vertical and horizontal water movement water movement based on the following soil conditions:

(A) The permeability difference between the original soil mound absorption area and slower permeability horizons below the original soil mound absorption area.

(B) The depth between the original soil mound absorption area and the change in permeability described in Section 17.4 (5)(A).

(C) The land slope.

(6) The minimum at-grade absorption bed width shall be calculated by dividing the contour loading rate by the soil loading rate of the upper 12 inches of soil.

(7) The minimum at-grade absorption length must be calculated by dividing the design flow by the soil loading rate found in Table IX in Minnesota Rules, Chapter 7080.2150[1] or Table VI for the upper 12 inches of soil and then dividing that value by the absorption bed width.

(8) The at-grade bed absorption width for slopes of one percent or greater does not include any width of the media necessary to support the upslope side of the pipe.

Table VII
At-Grade Contour Loading Rates

Perc Rate (mpi)	Loading Rate	Soil Texture	Other Characteristics in upper 48 inches	Contour Loading Rate (GPD/ft)
<0.1*	0.00	Coarse Sand	No textural change	6
			Saturated soil <3' Bedrock<4'	5
0.1 to 5.0	1.60	Sand Loamy Sand Fine Sand	No textural change	8
			Layers of other textures	7
			Banding	4
			Saturated soil <3'	5
			Bedrock<4'	5
6 to 15	1.00	Sandy Loam	Strong to moderate structure No textural change	7
			Weak structure Layers of other textures	6
			Platy or massive structure Saturated soil <3' Bedrock<4'	5
16 to 60	0.6-0.78	Loam Silt Loam Silt Clay Loam Sandy Clay Silty Clay	Strong to moderate structure No textural change	6
			Weak structure Layers of other textures	5
			Platy or massive structure Saturated soil <3' Bedrock<4'	4
61 to 120 >120	0.0-0.3	Clay Sandy Clay Silty Clay	Strong to moderate structure No textural change	3
			Weak structure Layers of other textures	2
			Platy or massive structure Saturated soil <3' Bedrock<4'	2

*See Section 18.2 for a system with this type of soil (Type II, Rapidly Permeable Soils Systems)

(9) At-grade systems must employ pressurized distribution by meeting or exceeding the applicable requirements of Section 14 and Section 15. At-grade systems located on slopes of one percent or greater require only one distribution pipe located on the upslope edge of the distribution media, with the absorption bed width being measured from the distribution pipe to the downslope edge of the media. Multiple distribution pipes are allowed to be used to provide even distribution, if necessary, based on site conditions.

(10) The upslope edge of an at-grade absorption bed must be installed along the natural contour.

(11) At-grade materials must be placed using construction techniques that minimize compaction.

(12) Six inches of loamy or sandy cover material must be installed over the distribution media. Cover must extend at least five feet from the ends of the rock bed and be sloped to divert surface water. Side slopes must not be steeper than four horizontal units to one vertical unit. Six inches of topsoil borrow must be placed on the cover material.

(13) One vertical inspection pipe of at least four inches in diameter must be installed along the downslope portion of the absorption bed. The inspection pipe must have three-eights inch or larger perforations spaced vertically no more than six inches apart. Perforations must not exist above the distribution medium. The inspection pipe must extend to the absorption bed and soil interface, be secured, and be capped, flush with or above finished grade.

(14) A vegetative cover must be established over the entire area of the at-grade. The at-grade shall be protected until a vegetative cover is established by use of erosion control. The established vegetative cover shall not interfere with the hydraulic performance of the system and shall provide adequate frost and erosion protection.

SECTION 18 TYPE II SYSTEMS

18.1 Systems designed according to this Section are considered Type II systems. Systems in soils with a loading rate less than 0.45 gallons per day per square foot cannot be used in a Type II system for new construction.

18.2 Rapidly Permeable Soils

(1) A system must be designed under this part if the soil in the proposed absorption area, or within three vertical feet of the absorption area, has a soil texture groups of 1 through 3 in Table IX in Minnesota Rules, Chapter 7080.2150[1] or a percolation rate of 0.1 to 5.0 minutes per inch in Table VI. The system must meet or exceed the following requirements:

(A) Employ flow values in Section 12.

(B) Meet or exceed applicable technical requirements of Section 13, Section 14, and Section 15, except as modified in this part.

(C) Meet or exceed the requirements of Sections 17.2 to 17.4.

(D) Meet or exceed requirements of Section 16.2 and 16.3, except as modified in this Section.

(E) Meet the requirements of Section 18.2 (2) to Section 18.2 (3)

(2) The distribution media must not be in contact with soils with a texture group of 1 in Table IX in Minnesota Rules, Chapter 7080.2150[1] or a percolation rate of less than 0.1 minutes per inch in Table VI.

(3) If the distribution media is in contact with soil with soil texture groups 2 or 3 in Table IX in Minnesota Rules, Chapter 7080.2150[1] or a percolation rate of 0.1 to 5.0 minutes per inch in Table VI, the distribution of effluent must comply with Minnesota Rules, Chapter 7080[6].

18.3 Floodplain Areas

(1) SSTS must be designed under this part if the system is proposed to be located in a floodplain. A system located in a floodplain must meet or exceed the following requirements:

(A) Employ flow values in Section 12.

(B) Meet or exceed applicable technical requirements of Section 13, Section 14, and Section 15, except as modified in this part.

(C) Meet or exceed the requirements of Sections 17.2 to 17.4.

(D) Meet or exceed requirements of Section 16.2 and 16.3, except as modified in this part.

(E) Meet the requirements of Section 18.3 (2) to Section 18.3 (11).

(2) The allowed use of systems in floodplains must be according to state and local floodplain requirements.

(3) An SSTS must not be located in a floodway and, whenever possible, placement within any part of the floodplain should be avoided. If no alternative exists, a system is allowed to be placed within the flood fringe if the requirements of Section 18.3 (4) to Section 18.3 (11) are met.

(4) There must be no inspection pipe or other installed opening from the distribution media to the soil surface.

(5) An SSTS must be located on the highest feasible area of the lot and must have the location preference over all other improvements, except the water supply well. If the ten-year flood data are available, the bottom of the distribution media must be at least as high as the elevation of the ten-year flood.

(6) If a pump is used to distribute effluent to the soil treatment and dispersal system, provisions shall be made to prevent the pump from operating when inundated with floodwaters.

(7) When it is necessary to raise the elevation of the soil treatment system to meet the vertical separation distance requirements, a mound system as specified in Section 17.3 is allowed to be used with the following additional requirements:

(A) The elevation of the bottom of the mound bed absorption area must be at least on-half foot above the ten-year flood elevation, if ten-year flood data are available.

(B) In no case shall the sand fill for the mound exceed 48 inches below the mound bed absorption area.

(C) Inspection pipes must not be installed unless the top of the mound is above the 100-year flood elevation.

(D) The placement of clean sand and other fill must be done according to any community adopted floodplain management ordinance.

(8) When the top of a sewage tank is inundated, the dwelling must cease discharging sewage into it.

(9) Backflow prevention of liquid into the building when the system is inundated must be provided. If a holding tank is used, the system must be designed to permit rapid diversion of sewage into the holding tank when the system is inundated.

(10) If a holding tank is used to serve a dwelling, the holding tank's capacity must equal 100 gallons times the number of bedrooms times the number of days between the ten-year stage on the rising limb of the 100-year flood hydrograph and the ten-year stage on the falling limb of the hydrograph, of 1,000 gallons, whichever is greater. The holding tank must be accessible for removal of tank contents under flooded conditions.

(11) Whenever the water level has risen above the top of a sewage tank, the tank must be pumped to remove all solids and liquids after the flood has receded and before use of the system is resumed.

18.4 Privies

(1) Privies shall only be considered when there is no water supplied to the dwelling.

(2) Pit privies shall not be installed where the bottom of the pit is less than three feet above the saturated soil or bedrock. A vault privy shall be used in areas not meeting the three foot separation.

The vault of a vault privy shall be constructed in the same manner as a sewage tank in accordance with Section 13.

(3) Privies shall be set back from surface waters, buildings, property lines, and water supply wells as prescribed in Table V.

(4) Pits or vaults shall be of sufficient capacity for the dwelling they serve, but shall have at least 50 cubic feet of capacity. The sides of the pit shall be curbed to prevent cave-in. The privy shall be constructed so as to be easily maintained and it shall be insect proof. The door and seat shall be self-closing. All exterior openings, including vent openings, shall be screened.

(5) Privies shall be adequately vented.

(6) When the privy is filled to within one foot of the top of the pit, the solids shall be removed.

(7) Abandoned pits shall have the solids removed and be filled with clean earth and slightly mounded to allow for settling. Removed solids shall be disposed of in accordance with Section 22.

18.5 Holding Tanks

(1) Holding tanks may be considered for installation on previously developed sites, as a temporary method for periods of up to 12 months, during which time measures are taken to provide municipal sewer service or the installation of an approved system as provided in this Chapter.

(2) Holding tanks may be considered on a permanent basis for non-residential, low water use establishments with a sewage flow of 150 gallons per day or less, subject to approval by the Department or local unit of government.

(3) Holding tanks must be used for floor drains for vehicle parking areas and existing facilities potentially generating hazardous waste.

(4) To qualify as a holding tank, the system must:

(A) Meet or exceed applicable requirements of Section 13.

(B) Meet or exceed the applicable requirements of Section 16.2.

(C) Meet or exceed the requirements of Section 16.3 (2).

(D) Meet the requirements of Section 18.5 (2) to Section 18.5 (10).

(5) All tanks used as holding tanks must be tested once placed at the final location for watertightness as specified in Minnesota Rules, Chapter 7080.2010.

(6) A cleanout pipe of at least six inches in diameter must extend to the ground surface and be provided with seals to prevent odor emissions and exclude insects and vermin. A maintenance hole of at least 20 inches in least dimension must extend through the cover to a point within 12 inches, but no closer than six inches, below finished grade. If the maintenance hole is covered with less than six inches of soil, the cover must be secured according the Section 13.13.

(7) For a dwelling, the minimum size is 1,000 gallons or 400 gallons times the number of bedrooms, whichever is greater. For other establishments, the minimum capacity shall be at least five times the design flow. Tank sizing for floodplain areas must be calculated according to Section 18.3 (10).

(8) Holding tanks must be located in an area readily accessible to the pump truck under all weather conditions and where accidental spillage during pumping will not create a nuisance and must meet the setback requirements of Table V.

(9) Holding tanks must have an alarm device to minimize the chance of accidental sewage overflow unless regularly scheduled pumping is used. An alarm device shall identify when the holding tank is at 75 percent capacity.

(10) A contract for disposal and treatment of the septage shall be maintained by the owner with a licensed Maintainer.

SECTION 19 TYPE III SYSTEMS

19.1 A system designed according to this part is considered a Type III system. A system in soils with a loading rate of less than 0.45 gallons per day per square foot may be installed on previously developed sites as a Type III system. The system must:

(1) Employ design flow values in Section 12.

(2) Meet or exceed technical requirements in Section 14.7 (1).

(3) Meet or exceed the requirements of Section 16.2.

(4) Meet or exceed the requirements of Section 16.3 (1), Section 16.3 (2), Section 16.3 (3), Section 16.3 (7), Section 16.3 (8), and Section 16.3 (9).

(5) For previously developed sites, if the site cannot accommodate a soil treatment and dispersal system sized in accordance with Table IX in Minnesota Rules, Chapter 7080.2150[1] or Table VI, a smaller soil treatment and dispersal system is allowed to be constructed if it employs flow restriction devices that do not allow loadings in excess of those in Table IX in Minnesota Rules, Chapter 7080.2150[1] or Table VI.

19.2 Absorption areas sized smaller than a Type I system must employ flow restriction devices that to not allow absorption area loadings in excess of those in Table IX in Minnesota Rules, Chapter 7080.2150[1] or Table VI. This provision does not apply to the original soil, clean sand absorption area of a mound system.

19.3 Type III systems can be used on previously developed sites only when a Type I or Type II system cannot be installed or is not the most suitable treatment.

19.4 Type III systems will not be allowed in areas where a new system or modifications to a new system are not feasible if failure occurs.

19.5 Type III systems will be allowed for undeveloped lots only when two Type I or Type II soil treatment and dispersal areas have been identified on the lot, in addition to the area utilized by the Type III soil treatment and dispersal area. The lot must be able to accommodate long-term sewage treatment in addition to the area utilized by the Type III system.

19.6 Graywater Systems

(1) Graywater Systems shall be classified as a Type III system and must meet or exceed the following requirements:

(A) Employ 60 percent of the flow values in Section 12.

(B) Meet or exceed applicable requirements of Section 13, Section 14, and Section 15, except as modified in this part.

(C) Meet or exceed the requirements of Section 17.

(D) Meet or exceed the requirements of Section 16.2 and Section 16.3.

(E) Meet the requirements of Section 19.6 (2) and Section 19.6 (3).

(2) Toilet waste must not be discharged to a graywater system.

(3) The liquid capacity of a graywater septic tank serving a dwelling must be based on the number of bedrooms existing and anticipated in the dwelling served and shall be at least as large as the capacities given in Table VIII.

Table VIII – Minimum Septic Tank Capacity for Graywater Systems

Number of Bedrooms	Tank 1	Tank 2
Two or less	1,000	500
Three	1,000	500
Four to Five	1,000	1,000
Six to Seven	1,000	1,000
Eight to Nine	1,500	1,000
Ten or More	Septic tank shall be sized as: (2,000 + ((# of bedrooms - 9) X 150)).	

SECTION 20 TYPE IV SYSTEMS

20.1 A system designed according to this part is considered a Type IV System. The system must:

(1) Employ design flow values in Section 12.

(2) Meet or exceed applicable technical requirements of Section 13, Section 14, and Section 15.

(3) Meet or exceed the requirements of Section 16.2.

(4) Meet or exceed the requirements of Section 16.3 (1) and Section 16.3 (2).

(5) Meet or exceed the requirements of Table IX, and Table XII in Minnesota Rules, Chapter 7080.2350[4] or Table X.

20.2 Type IV systems can be used on previously developed sites only when a Type I or Type II system cannot be installed or is not the most suitable treatment.

20.3 Type IV systems will not be allowed in areas where a new system or modifications to a new system are not feasible if failure occurs.

20.4 Type IV systems will be allowed for undeveloped lots only when two Type I or Type II soil treatment and dispersal areas have been identified on the lot, in addition to the area utilized by the Type III soil treatment and dispersal area. The lot must be able to accommodate long-term sewage treatment in addition to the area utilized by the Type IV system.

Table IX
TREATMENT COMPONENT PERFORMANCE LEVELS AND METHOD OF DISTRIBUTION BY TEXTURE GROUP[1].

<table>
<tr><th rowspan="2">Vertical Separation (inches)</th><th colspan="3">Soil Texture Group Found in Table IX in Minnesota Rules, Chapter 7080.2150[1]</th></tr>
<tr><th>1-5</th><th>6-9</th><th>10-11</th></tr>
<tr><td>12 – 17</td><td colspan="3">Treatment Level A, Pressure Distribution, Timed Dosing</td></tr>
<tr><td>18 - 23</td><td colspan="2">Treatment Level B, Pressure Distribution, Timed Dosing</td><td>Treatment Level B, Pressure Distribution</td></tr>
<tr><td>24 - 36</td><td>Treatment Level B, Pressure Distribution, Timed Dosing</td><td colspan="2">Treatment Level B, Pressure Distribution</td></tr>
</table>

[1] The treatment component performance levels correspond with those established for treatment components under the product testing requirements in Table III of Minnesota Rules, 7083.4030.

20.5 A Type IV system's absorption area must be sized according to Table XII-Loading Rates for Determining Bottom Absorption Area for Trenches and Seepage Beds for Effluent Meeting Treatment Level A and B and Absorption Ratios for Determining Mound Absorption Areas Using Detailed Soil Descriptions, as found in Minnesota Rules, Chapter 7080.2350[4], or by using Table X if not using detailed soil descriptions.

Table X

LOADING RATES FOR DETERMINING BOTTOM ABSORPTION AREA FOR TRENCHES AND SEEPAGE BEDS FOR EFFLUENT MEETING TREATMENT LEVELS A AND B AND ABSORPTION RATIOS FOR DETERMINING MOUND ABSORPTION AREAS USING PERCOLATION TESTS.

Percolation Rate (Minutes Per Inch)	Soil Loading Rate (gpd/ft^2)	Mound Absorption Ratio
<0.1*	-	-
0.1 – 5*	1.60	1
0.1 – 5 (Soil Texture Group 3)	1.0	2
6 – 15	1.0	1.3
16 – 30	0.78	2
31 – 45	0.78	2.4
46 – 60	0.6	2.6
>60	0.3	5.0

*See Section 18.2 for a system with this type of soil (Type II, Rapidly Permeable Soils Systems)

SECTION 21 TYPE V SYSTEMS

21.1 A system designed according to this part is considered a Type V system. The system must:

(1) Employ design flow values in Section 12.

(2) Meet or exceed the requirements of Section 16.2.

(3) Be designed with vertical separation that ensures adequate sewage dispersal and treatment. Design factors to consider include, but are not limited to, effluent quality, loading rates, groundwater mounding if loading rates are in excess of those in Table XII in Minnesota Rules, Chapter 7080.2350[4] or Table X, loading methods, and soil conditions. SSTS must not contaminate underground waters or zones of periodic saturation with viable fecal organisms.

21.2 Type V systems can be used on previously developed sites only when a Type I or Type II system cannot be installed or is not the most suitable treatment.

21.3 Type V systems will not be allowed in areas where a new system or modifications to a new system are not feasible if failure occurs.

21.4 Type V systems will be allowed for undeveloped lots only when two Type I or Type II soil treatment and dispersal areas have been identified on the lot, in addition to the area utilized by the Type III soil treatment and dispersal area. The lot must be able to accommodate long-term sewage treatment in addition to the area utilized by the Type V system.

SECTION 22 MAINTENANCE

22.1 All new and replacement SSTS must be operated in accordance with the management plan submitted, reviewed and approved by the Department or local unit of government. At a minimum, management plans must include the following:

(1) maintenance requirements, including frequency;

(2) operational requirements, including which tasks the owner can perform and which tasks a licensed service provider or maintainer must perform;

(3) monitoring requirements;

(4) requirements that the owner notify the Department when the management plan requirements are not met;

(5) disclosure of the location and condition of the additional soil treatment and dispersal area on the lot or serving that residency; and

(6) other requirements determined by the Department.

22.2 SSTS and all components must be maintained in compliance with this Chapter and manufacturer requirements.

22.3 The owner of an SSTS or the owner's agent shall regularly, but in no case less frequently than every three years:

(1) Assess whether sewage tanks leak below the designed operating depth and whether sewage tank tops, riser joints, and riser connections leak through visual evidence of major defects.

(2) Measure or remove the accumulation of scum, grease, and other floating materials at the top of each septic tank and compartment, along with the sludge, which consists of solids denser than water.

22.4 All solids and liquids must be removed by pumping from all tanks or compartments in which the top of the sludge layer is less than 12 inches from the bottom of the outlet baffle or transfer hole or whenever the bottom of the scum layer is less than three inches above the bottom of the outlet baffle or transfer hole. Total sludge and scum volume must not be greater than 25 percent of the tank's liquid capacity.

22.5 Removal of accumulated sludge, scum, and liquids from septic tanks and pump tanks must be through the maintenance hole. The removal of solids from any location other than the maintenance hole is not a compliant method of solids removal from a sewage tank, and this method does not fulfill the solids removal requirements of this Section or a management plan. Liquid and solids removal from cleanout pips is allowed for holding tank.

22.6 After removal of solids and liquids, from a system installed after the effective date of this Chapter, the system shall be secured as described in Section 13.13. Covers secured by screws shall be refastened in all screw openings.

22.7 After removal of solids and liquids from a system installed prior to the effective date of this Chapter covers must:

(1) Be brought into compliance with Section 13.13 if retrofitted to be brought above the ground surface.
(2) Be secured by covering with a minimum of 12 inches of soil.
(3) If the cover was currently at or above grade, the system must be secured by a method that was deemed secure prior to the effective date of this Chapter.

22.8 Pump tanks must be maintained according to this part. Sludge must be removed if within one inch of the pump intake.

22.9 When a privy is filled to one half of its capacity, the solids must be removed. Abandoned pits must have the sewage solids and contaminated soil removed and must be filled with clean earth and slightly mounded to allow for settling. Removed solids shall be disposed of according to Section 22.11.

22.10 Additives, which are products added to the sewage or to the system with the intent to lower the accumulated solids in sewage, must not be used as a means to reduce the frequency of proper maintenance and removal of sewage solids from the sewage tanks as specified in this Section. The use of additives does not fulfill the solids removal requirement of this Section or a management plan. Additives that contain hazardous wastes must not be used in an SSTS.

22.11 Septage or any waste mixed with septage must be disposed of in accordance with state, federal, or local requirements for septage and other wastes. If septage is disposed of into a sewage or septage treatment facility, a written agreement must be provided between the accepting facility and the maintenance business.

22.12 Activities on the current soil dispersal system or the reserve soil dispersal system, as defined in Section 2.2 (58) and described in Section 9.4, that impair the current or future treatment abilities or hydraulic performance of the soil dispersal system are prohibited. This includes, but is not limited to, covering all or part of the soil treatment system with an impermeable surface as determined by the local unit of government.

22.13 Any maintenance activity used to increase the acceptance of effluent to a soil treatment and dispersal system must:

(1) Not be used on a system failing to protect groundwater as defined in Section 4.3 (2), unless the activities meet the requirements of Section 20 or Section 21.

(2) Not decrease the separation to the periodically saturated soil or bedrock.

(3) Not cause preferential flow from the soil treatment and dispersal system bottom to the periodically saturated soil or bedrock.

(4) Be conducted by an appropriately certified qualified employee or an appropriately licensed business as specified in Minnesota Rules, Chapter 7083.0790. Any substance added with the intent to increase the infiltration rate of the soil treatment and dispersal system must not contain hazardous substances.

22.14 Licensed maintenance businesses must maintain accurate records of pumping activity in the County and shall report such data annually to the Department on forms provided.

22.15 MSTS must be maintained according to this Section.

22.16 All external grease interceptors must be routinely inspected to determine the volume of grease present. All external grease interceptors must be properly maintained to prevent clogging of downstream piping and system components.

22.17 For all MSTS constructed after the effective date of this Chapter, the designer must complete an operation and maintenance manual and the manual must be submitted to the Department or the local unit of government before system operation. The manual shall include a copy of the plans and specifications, as-built drawings of the system, and information to properly operate the system.

22.18 All new MSTS shall be operated under a local operating permit submitted and approved with the design.

22.19 All groundwater shall be monitored in accordance with Section 11.

22.20 Any operational noncompliance must be immediately corrected and reported by the owner or service provider to the Department or local unit of government.

SECTION 23 SYSTEM ABANDONMENT

23.1 All systems with no future intent for use must be abandoned according to this Section. Tank abandonment procedures for sewage tanks, cesspools, leaching pits, drywells, seepage pits, vault privies, pit privies, and distribution devices must meet the requirements of Section 23.1 (1) to Section 23.1 (3).

(1) All solids and liquids must be removed and disposed of according to Section 22 by a licensed maintenance business.

(2) All electrical devices and devices containing mercury must be removed and disposed of according to applicable regulations.

(3) Abandoned tanks or any other underground cavities must be removed or remain in place and crushed with the remaining cavity filled with soil or rock material.

(4) The removed tank or tank fragments and any soil visually contaminated with sewage shall be disposed in accordance with Section 23.3.

23.2 Access for future discharge to the system must be permanently denied.

23.3 If soil treatment and dispersal systems are removed, contaminated materials shall be properly handled to prevent human contact. Contaminated materials include distribution media, soil or sand within three feet of the system bottom, distribution pipes, tanks, and contaminated soil around leaky tanks. Contaminated material also includes any soil that received sewage from a surface failure. Contaminated materials must be disposed of according to Section 23.3 (1) to Section 23.3 (2).

(1) Contaminated materials disposed of offsite must be disposed of according to Section 22.11.

(2) If contaminated material is to be spread or used on site within one year of contact with sewage, the material must be placed in an area meeting the soil and setback requirements described in Table V in Section 16 and Section 16.3 (3) of this Chapter and the material must be covered with a minimum of six inches of uncontaminated soil and protected from erosion. After one year following contact with sewage, the material is allowed to be spread in any location meeting the setback requirement of Minnesota Rules, Chapter 4725.4450, covered with a minimum of six inches of uncontaminated soil, and protected from erosion. After one year following contact with sewage, the material is allowed to be used to fill in the abandoned in place sewage tanks.

(3) Contaminated pipe, geotextile fabric, or other material must be dried and disposed of in a mixed municipal solid waste landfill.

23.4 The person or business abandoning the system must complete and sign a record of abandonment that states the system was abandoned according to this Section. A description of the abandonment procedure must be recorded including a map of the remaining in-place components and location of the components removed. The record must be sent to the Department or local unit of government within 90 days of abandonment.

23.5 MSTS no longer in use must be abandoned according to this Section.

SECTION 24 PRODUCT REGISTRATION

24.1 All product registration shall be in accordance with Minnesota Rules 7083.4000 to 7083.4120.

24.2 Technology and products employed in system design shall adequately protect the public health and the environment as determined by Minnesota Rules, Chapter 7083, and be approved for use by the Department or local unit of government.

SECTION 25 ENFORCEMENT

25.1 It is hereby declared unlawful for any person, firm or corporation to violate any term or provision of this Chapter. Violation thereof shall be a misdemeanor. Each day that a violation is allowed to continue shall constitute a separate offense.

25.2 In the event of a violation or threatened violation of this Chapter, the Department, in addition to other remedies, may request appropriate actions or proceedings to prevent, restrain, correct or abate such violations or threatened violations. In addition, written notice in the form of a license complaint may be made to the Commissioner of the Minnesota Pollution Control Agency.

25.3 In cases where a public health nuisance has been determined to exist, the Department may institute enforcement action under the Local Public Health Act, Minnesota Statutes, Chapter 145A and the Washington County Public Health Nuisance Ordinance, Washington County Ordinance No. 165, or subsequent revisions there to.

SECTION 26 SEPARABILITY

26.1 It is hereby declared to be the intent that the several provisions of this regulation are separable in accordance with the following:

(1) If any court of competent jurisdiction shall adjudge any provision of the regulation to be invalid, such judgment shall not affect other provisions of this regulation not specifically included in said judgment.

(2) If any court of competent jurisdiction shall adjudge invalid the application of any provision of this regulation to a particular property, building or structure, such judgment shall not affect the application of said provision to any other property, building or structure not specifically included in said judgment.

SECTION 27 EFFECTIVE DATE

27.1 The regulations contained in this Chapter shall become effective from and after September 23, 2009, after their publication according to law.

APPENDIX A SOIL LOADING RATES FOR LEVEL C TREATMENT

Loading Rates for Determining Bottom Absorption Area for Trenches and Seepage Beds for Effluent Treatment Level C and Absorption Ratios for Determining Mound Absorption Areas using Detail Soil Descriptions

Texture	Texture Group	Structure		Consistence	Soil Loading Rate (gpd/ft^2)	Mound Absorption Ratio
		Type	Grade			
Coarse Sand*	1	Single Grain	Structureless	Loose	-	1.0
				Weakly Cemented Friable	-	2.0
				Cemented-Firm	-	-
Medium Sand*	2	Single Grain	Structureless	Loose	1.20	1.0
				Weakly Cemented Friable	0.60	2.0
				Cemented-Firm	-	-
Fine Sand	3	Single Grain	Structureless	Loose	0.60	2.0
				Weakly Cemented Friable	0.24	5.0
				Cemented-Firm	-	-
Coarse and Medium Loamy Sand*	4	Single Grain	Structureless	Loose	1.20	1.0
				Weakly Cemented Friable	0.60	2.0
				Cemented-Firm	-	-
Fine and Very Fine Loamy Sand	5	Single Grain	Structureless	Loose	0.60	2.0
				Weakly Cemented Friable	0.24	5.0
				Cemented-Firm	-	-
Coarse and Medium Sandy Loam	6	Prismatic, Blocky, Granular	Weak	Very Friable, Friable	0.45	2.6
				Firm	0.24	5.0
			Moderate or Strong	Very Friable, Friable	0.78	1.3
				Firm	0.45	2.6
		Platy	Weak	Very Friable, Friable	0.45	2.6
				Firm	0.24	5.0
			Moderate or Strong	Very Friable, Friable	0.45	2.6
				Firm	-	-
		Massive	Structureless	Very Friable, Friable	0.24	5.0
				Firm	-	-

Loading Rates for Determining Bottom Absorption Area for Trenches and Seepage Beds for Effluent Treatment Level C and Absorption Ratios for Determining Mound Absorption Areas using Detail Soil Descriptions						
Texture	**Texture Group**	**Structure**		**Consistence**	**Soil Loading Rate (gpd/ft^2)**	**Mound Absorption Ratio**
		Type	**Grade**			
Fine and Very Fine Sandy Loam	7	Prismatic, Blocky, Granular	Weak	Very Friable, Friable	**0.24**	**5.0**
				Firm	**0.24**	**5.0**
			Moderate or Strong	Very Friable, Friable	**0.60**	**2.0**
				fim	**0.24**	**5.0**
		Platy	Weak	Very Friable, Friable	**0.24**	**5.0**
				Firm	-	-
			Moderate or Strong	Very Friable, Friable	-	-
				Firm	-	-
		Massive	Structureless	Very Friable, Friable	**0.24**	**5.0**
				Firm	-	-
Loam	8	Prismatic, Blocky, Granular	Weak	Very Friable, Friable	**0.45**	**2.6**
				Firm	**0.24**	**5.0**
			Moderate or Strong	Very Friable, Friable	**0.60**	**2.0**
				Firm	**0.24**	**5.0**
		Platy	Weak	Very Friable, Friable	**0.24**	**5.0**
				Firm	-	-
			Moderate or Strong	Very Friable, Friable	-	-
				Firm	-	-
		Massive	Structureless	Very Friable, Friable	**0.24**	**5.0**
				Firm	-	-
Silt Loam	9	Prismatic, Blocky, Granular	Weak	Very Friable, Friable	**0.45**	**2.6**
				Firm	**0.24**	**5.0**
			Moderate or Strong	Very Friable, Friable	**0.50**	**2.4**
				Firm	**0.24**	**5.0**
		Platy	Weak	Very Friable, Friable	**0.24**	**5.0**
				Firm	-	-
			Moderate or Strong	Very Friable, Friable	-	-
				Firm	-	-
		Massive	Structureless	Very Friable, Friable	**0.24**	**5.0**
				Firm	-	-

Loading Rates for Determining Bottom Absorption Area for Trenches and Seepage Beds for Effluent Treatment Level C and Absorption Ratios for Determining Mound Absorption Areas using Detail Soil Descriptions						
Texture	**Texture Group**	**Structure**		**Consistence**	**Soil Loading Rate (gpd/ft^2)**	**Mound Absorption Ratio**
		Type	**Grade**			
Clay Loam, Silty Clay Loam, Sandy Clay Loam	**10**	Prismatic, Blocky, Granular	Weak	Very Friable, Friable	**0.24**	**5.0**
				Firm	-	-
			Moderate or Strong	Very Friable, Friable	**0.45**	**2.6**
				Firm	**0.24**	**5.0**
		Platy	Weak	Very Friable, Friable	-	-
				Firm	-	-
			Moderate or Strong	Very Friable, Friable	-	-
				Firm	-	-
		Massive	Structureless	Very Friable, Friable	-	-
				Firm	-	-
Clay, Silty Clay, Sandy Clay	**11**	Prismatic, Blocky, Granular	Weak	Very Friable, Friable	-	-
				Firm	-	-
			Moderate or Strong	Very Friable, Friable	**0.24**	**5.0**
				Firm	-	-
		Platy	Weak	Very Friable, Friable	-	-
				Firm	-	-
			Moderate or Strong	Very Friable, Friable	-	-
				Firm	-	-
		Massive	Structureless	Very Friable, Friable	-	-
				Firm	-	-

APPENDIX B SOIL LOADING RATES FOR LEVEL A & B TREATMENT

Loading Rates for Determining Bottom Absorption Area for Trenches and Seepage Beds for Effluent Treatment Level A and Level B and Absorption Ratios for Determining Mound Absorption Areas using Detail Soil Descriptions

Texture	Texture Group	Structure		Consistence	Soil Loading Rate (gpd/ft^2)	Mound Absorption Ratio
		Type	Grade			
Coarse Sand*	1	Single Grain	Structureless	Loose	-	1.0
				Weakly Cemented Friable	-	2.0
				Cemented-Firm	-	-
Medium Sand*	2	Single Grain	Structureless	Loose	1.60	1.0
				Weakly Cemented Friable	0.78	2.0
				Cemented-Firm	-	-
Fine Sand	3	Single Grain	Structureless	Loose	1.00	2.0
				Weakly Cemented Friable	0.12	2.0
				Cemented-Firm	-	-
Coarse and Medium Loamy Sand*	4	Single Grain	Structureless	Loose	1.60	1.0
				Weakly Cemented Friable	0.78	2.0
				Cemented-Firm	-	-
Fine and Very Fine Loamy Sand	5	Single Grain	Structureless	Loose	1.00	2.0
				Weakly Cemented Friable	0.45	5.0
				Cemented-Firm	-	-
Coarse and Medium Sandy Loam	6	Prismatic, Blocky, Granular	Weak	Very Friable, Friable	0.60	2.6
				Firm	0.45	5.0
			Moderate or Strong	Very Friable, Friable	1.00	1.3
				Firm	0.60	2.6
		Platy	Weak	Very Friable, Friable	0.60	2.6
				Firm	0.45	5.0
			Moderate or Strong	Very Friable, Friable	0.60	2.6
				Firm	-	-
		Massive	Structureless	Very Friable, Friable	0.45	5.0
				Firm	-	-

Loading Rates for Determining Bottom Absorption Area for Trenches and Seepage Beds for Effluent Treatment Level A and Level B and Absorption Ratios for Determining Mound Absorption Areas using Detail Soil Descriptions

Texture	Texture Group	Structure		Consistence	Soil Loading Rate (gpd/ft^2)	Mound Absorption Ratio
		Type	Grade			
Fine and Very Fine Sandy Loam	7	Prismatic, Blocky, Granular	Weak	Very Friable, Friable	0.45	5.0
				Firm	0.45	5.0
			Moderate or Strong	Very Friable, Friable	0.78	2.0
				fim	0.45	5.0
		Platy	Weak	Very Friable, Friable	0.45	5.0
				Firm	0.00	-
			Moderate or Strong	Very Friable, Friable	0.24	-
				Firm	-	-
		Massive	Structureless	Very Friable, Friable	0.45	5.0
				Firm	-	-
Loam	8	Prismatic, Blocky, Granular	Weak	Very Friable, Friable	0.60	2.6
				Firm	0.45	5.0
			Moderate or Strong	Very Friable, Friable	0.78	2.0
				Firm	0.45	5.0
		Platy	Weak	Very Friable, Friable	0.45	5.0
				Firm	-	-
			Moderate or Strong	Very Friable, Friable	0.24	-
				Firm	-	-
		Massive	Structureless	Very Friable, Friable	0.45	5.0
				Firm	-	-
Silt Loam	9	Prismatic, Blocky, Granular	Weak	Very Friable, Friable	0.60	2.6
				Firm	0.45	5.0
			Moderate or Strong	Very Friable, Friable	0.78	2.4
				Firm	0.45	5.0
		Platy	Weak	Very Friable, Friable	0.45	5.0
				Firm	-	-
			Moderate or Strong	Very Friable, Friable	-	-
				Firm	-	-
		Massive	Structureless	Very Friable, Friable	0.30	5.0
				Firm	-	-

Loading Rates for Determining Bottom Absorption Area for Trenches and Seepage Beds for Effluent Treatment Level A and Level B and Absorption Ratios for Determining Mound Absorption Areas using Detail Soil Descriptions

Texture	Texture Group	Structure		Consistence	Soil Loading Rate (gpd/ft^2)	Mound Absorption Ratio
		Type	Grade			
Clay Loam, Silty Clay Loam, Sandy Clay Loam	10	Prismatic, Blocky, Granular	Weak	Very Friable, Friable	0.30	5.0
				Firm	-	-
			Moderate or Strong	Very Friable, Friable	0.60	2.6
				Firm	0.30	5.0
		Platy	Weak	Very Friable, Friable	-	-
				Firm	-	-
			Moderate or Strong	Very Friable, Friable	-	-
				Firm	-	-
		Massive	Structureless	Very Friable, Friable	-	-
				Firm	-	-
Clay, Silty Clay, Sandy Clay	11	Prismatic, Blocky, Granular	Weak	Very Friable, Friable	-	-
				Firm	-	-
			Moderate or Strong	Very Friable, Friable	0.30	5.0
				Firm	-	-
		Platy	Weak	Very Friable, Friable	-	-
				Firm	-	-
			Moderate or Strong	Very Friable, Friable	-	-
				Firm	-	-
		Massive	Structureless	Very Friable, Friable	-	-
				Firm	-	-

Footnotes: The Department's interpretation of Chapter Four is as follows:

1. This Department adopted Table IX in Minnesota Rules 7080.2150 as now constituted and from time to time amended.
2. This Department adopted Minnesota Rules 7080.1910 to 7080.2020 as now constituted and from time to time amended.
3. This Department adopted Minnesota Rules 7080.2050 as now constituted and from time to time amended.
4. This Department adopted Table XII in Minnesota Rules 7080.2350 as now constituted and from time to time amended.
5. All trenches and seepage beds in accordance with Minnesota Rules, Chapter 7080.2050, as now constituted and from time to time amended.
6. If the distribution media is in contact with soil with soil texture groups 2 or 3 in Table IX in Minnesota Rules, Chapter 7080.2150[1] or a percolation rate of 0.1 to 5.0 minutes per inch in Table VI, the distribution of effluent must comply with Minnesota Rules, Chapter 7080.2060, as now constituted and from time to time amended.

BOARD OF COUNTY COMMISSIONERS
WASHINGTON COUNTY, MINNESOTA

RESOLUTION NO. 2009-089

DATE September 8, 2009

DEPARTMENT Public Health & Environment

MOTION BY COMMISSIONER Weik

SECONDED BY COMMISSIONER Kriesel

RESOLUTION ADOPTING AN AMENDMENT TO THE WASHINGTON COUNTY DEVELOPMENT CODE, CHAPTER FOUR, SUBSURFACE SEWAGE TREATMENT SYSTEM REGULATIONS

WHEREAS, the Minnesota Pollution Control Agency (MPCA) revised Minnesota Rules, Chapter 7080, Individual Sewage Treatment System Program, into Minnesota Rules, Chapters 7080 through 7083, Subsurface Sewage Treatment System Program, on February 4, 2008; and

WHEREAS, Minnesota Rules, Chapter 7082, Section 7082.0050, Subpart 1, Paragraph B requires that the County update its ordinance by February 4, 2010; and

WHEREAS, the most recent version of this ordinance is Washington County Ordinance No. 128, Individual Sewage Treatment System Regulations, adopted by the County Board on October 20, 1997; and

WHEREAS, on October 14, 2008, a presentation was made by the Department of Public Health and Environment to the County Board to review proposed changes to the Ordinance; and

WHEREAS, on June 23, 2009, the Washington County Planning Advisory Commission referred the Subsurface Sewage Treatment System Regulations in the form of Chapter Four of the Washington County Development Code to the County Board with their recommendations; and

WHEREAS, on September 8, 2009, the Washington County Board of Commissioners conducted a public hearing to consider adopting Chapter Four of the Washington County Development Code.

NOW, THEREFORE, BE IT RESOLVED, that the Washington County Board of Commissioners hereby adopts Washington County Subsurface Sewage Treatment System Ordinance No. 179 to take effect upon the passage of this resolution and its publication according to law.

NOW, THEREFORE, BE IT FURTHER RESOLVED, that Washington County Ordinance No. 128 is hereby replealed, said repeal to take effect on the date Washington County Ordinance No. 179 becomes effective.

ATTEST: James R. Schoog
COUNTY ADMINISTRATOR

Myron Peterson
CHAIRMAN, COUNTY BOARD

	YES	NO
HEGBERG	X	
KRIESEL	X	
PETERSON	X	
PULKRABEK	X	
WEIK	X	

Washington County

DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT
GOVERNMENT CENTER
14949 62nd STREET NORTH P.O. BOX 6 STILLWATER, MN 55082-0006
Office: 651-430-6655 TDD: 651-430-6246 FAX: 651-430-6730

SSTS MAINTENANCE REPORT

System Location			
Address			Telephone Number
City	State	ZIP	Property ID No./GEO Code
Owner	Pumping Date		
Contractor			
Maintainer	MPCA License No.		Telephone Number

What was done to the system?

- ☐ Tank(s) Pumped
- ☐ Sludge and scum measured.
  Do tanks need to be pumped?
  ☐ Yes ☐ No (*If no provide measurements below*)

Report Liquid Capacity in Gallons

Tank 1: _____ ☐ Pumped Tank 2: _____ ☐ Pumped
Tank 3: _____ ☐ Pumped Tank 4: _____ ☐ Pumped
Total Gallons Pumped: _____

Visual Inspection (*note any problems with the system*):

NOTE: This does not serve as a compliance inspection.

***Tank Measurements-Use Only If Tank(s) Were NOT Pumped**

Tank Length _____ in. **X** Tank Width _____ in. **X** Tank Depth _____ in. = Tank Volume (cubic inches) _____

Tank Radius _____ in. **X** Tank Radius _____ in. **X 3.14** = Tank Volume (cubic inches) _____

Tank Volume (cu. in.) _____ **/ 231.01** = Liquid Capacity _____ Gallons / Tank Depth _____ in. = Gallons/Inch _____

Sludge Level _____ in. **X** Gallons Per Inch _____ = Sludge Volume _____ Gallons

Scum Level _____ in. **X** Gallons Per Inch _____ = Scum Volume _____ Gallons

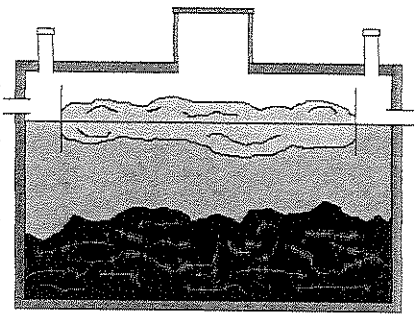
Sludge Volume _____ + Scum Volume _____ = Total Sludge and Scum Volume _____ Gallons

Total Sludge and Scum Volume _____ / Liquid Capacity _____ = Percent Sludge and Scum in Tank _____ %

Scum Layer

Effluent

Sludge Layer



Tank Depth measured from invert of outlet pipe to bottom of tank

*Tanks must be pumped if either of the following conditions exist:
1. The top of the sludge layer is less than 12 inches from the bottom of the outlet baffle; *or*
2. Total sludge and scum volume is greater than 25 percent of the tank's liquid capacity.

Signature _____ Date _____ Reset Form