Tyrone Lake Sanitary Sewer System Feasibility Study

Prepared by Spicer Group

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I. Introduction

Tyrone Lake is located in Hartland and Tyrone Townships in Livingston County. The sanitary sewer surrounding Tyrone Lake and the wastewater treatment system were constructed in 1989. The collection system consists of 183 individual septic tanks, each equipped with a gray water pump that discharges into a low pressure collection system. The low pressure collection system transfers the wastewater to the treatment site located north of Tyrone Lake. The wastewater treatment system consists of dosing tanks and septic fields. There are issues and concerns with both the collection system and the treatment system that are causing operational and maintenance costs to increase significantly. In the collection system there are inflow and infiltration problems that create the need for emergency pumping. There are also hydraulic issues in the collection system's force main. The treatment system has had repeated problems with its groundwater discharge permit, exceeding phosphorus, sodium and chloride limits, that have required permit variances in order to continue to use the treatment system. These are some of the reasons driving the need for an evaluation of the sanitary sewer system.

II. Collection System

The existing collection system sees significant increases in flow during wet weather events attributable to inflow and infiltration (I/I). Since the system is a low pressure collection system, the additional flows are entering the system at the homes or are introduced through another pumped connection. There are cases where water is entering the system directly into the septic tanks. The tanks in the system were the original septic tanks for the homes, whose condition and structural integrity were not confirmed when the public sewer system was installed. Defects in these structures could be a source of I/I as well as the extension chimneys whose seals are likely failing due to age. The ground water table is high in this area and there are no water stops installed at the pipe connections. Other sources of I/I can be from illegal connections from the homes including sump pumps, down spouts and footing drains tied into the septic tanks. Storm water connections are not allowed to be connected to the sanitary sewer system per both Hartland and Tyrone Township ordinances. These sources of I/I are very difficult to locate and would require inspection of each individual septic tank and home. Even with inspections of each tank, all of the problems or sources still may not be able to be located.

The increase in flows due to wet weather contribute to the hydraulic issues in the system that prevent individual systems from being able to discharge into the collection system and could result in back ups into the homes or sanitary sewer overflows at the septic tank location. During wet weather/high flow events, a vactor truck has been used on an emergency basis to pump down the collection system. In an effort to prevent sewer backups a vactor truck connects to the bypass connection and transports the wastewater to the treatment site. This emergency pumping procedure is being used with increasing regularity and the cost to do this has continued to increase.

The collection system consists primarily of 2" diameter pipe along both the west and east sides of the lake. See map in Appendix A. The existing system consists of 14,645 lineal feet of 2" force main and 1440 lineal feet of 3" force main. The collection system was hydraulically modeled and it was determined that 93% of the system is undersized

according to the model. This was based on domestic usage for 191 connections, which is the number of assessed parcels in the service district. The model identified the following:

- 1,070 lineal feet of the collection system is acceptable at 2"
- 5,655 lineal feet of the collection system needs to be upgraded to 3"
- 7,920 lineal feet of the collection system needs to be upgraded to 4"
- 1,440 lineal feet of the collection system needs to be upgraded to 6"

The existing force main is located along the lake which poses access issues. While the HDPE main itself has not had frequent breaks, the 1 ¼" PVC service leads have had an extensive number of breaks. Therefore, as part of this study, relocating the main as well as replacing the service leads were both considered in the options evaluated. PVC is a very brittle material that is more conducive to breaking when hydraulic pressures increase and during temperature variations especially in more shallow installations like it is used here. The ground conditions consist of peat in most areas which is especially prone to movement, resulting in breaks in the PVC lines, particularly spring during the spring thaw. In addition, plastic check valves and weak couplers lead to additional break points and repairs. Not only are the breaks difficult and costly, but they pose an environmental concern due to their close proximity to the lake. A service break can result in a sanitary sewer overflow that not only contaminates the surface of the ground, but can flow overland directly to the lake. There have been at least four sanitary sewer overflows in the last eight years due to service lead breaks that have resulted in at least 46,500 gallons of reported raw sewage being spilled onto the ground and entering Tyrone Lake.

The pumps in the septic tanks are reaching, have reached, or surpassed their useful life. Mechanical and electrical equipment is generally rated for a 20 year useful life which has reached this year. Currently about 30 pumps are budgeted for annually at $14,600 per year. This allows for the pumps to be replaced on a six year schedule.

Sludge removal is another ongoing cost for the collection system. The STEP systems wastewater enters the septic tank where the solids are allowed to settle and the gray water is pumped to the collection system. The original tanks were allowed to be used as long as they were a minimum of 1000 gallons in size. Therefore, in some cases a single chamber tank was used, which does not provide for the proper settlement and causes premature plugging of the filters without having the dual compartments. The solids biologically breakdown partially, but ultimately they have to be removed from the tank on a regular basis to maintain adequate treatment and tank capacity. Currently, tanks are pumped out every three to five years, at approximately $175-215/tank. Costs for tank pumping continue to rise as disposal regulations tighten. This is an ongoing system cost that will increase annually if the STEP treatment systems continue to be used.

In summary, there are several issues in the collection system:

1) It is physically undersized for the contributing flows.
2) There are excess flows due to I/I contribution which exacerbates the hydraulic problems.

3) The service leads are breaking frequently which are difficult to access, costly to repair due to the force main location, and pose a health and safety risk due to sanitary sewer overflows into the lake.

4) Operation and maintenance costs are increasing due to a) emergency pumping, b) equipment failure (pump replacement) due to age c) service lead breaks due to material type and aged) sludge hauling and septic tank cleaning.

Collection System Alternatives

Several alternatives were considered to correct the problems with the collection system.

1. Replace the portions of the collection system that are of inadequate size in the existing location along the lakeshore.
   This alternative would correct the hydraulic problems in the collection system that requires emergency pumping situations. The existing collection system is of inadequate size for the number of homes connected. The force main would be replaced in its existing location along the lake side which would have shorter service leads than locating the force main along the road. This alternative would include replacing the 1 ¼" service leads from the tanks to the main with HDPE which should resolve the break issues as well as the issues with access along the lake. This alternative alone does not remove or reduce inflow and infiltration in the system, nor does it address the need for pump replacement or sludge removal at the individual homes; but could be combined with other alternatives listed below. The construction cost for this alternative is $793,327 and a detailed breakdown can be found in Appendix D. The annual operation and maintenance cost for this alternative would be less than the current costs since the emergency pumping costs would be significantly reduced if not eliminated, and the service lead repair costs would be significantly reduced if not eliminated.

2. Replace the entire collection system on the road side.
   This alternative would correct the hydraulic problems in the collection system that requires emergency pumping situations. The existing collection system is of inadequate size for the number of homes connected. The force main would be replaced along the road for better accessibility to the force main and service lead shutoffs. This alternative would include replacing the 1 ¼" service leads from the tanks to the main with HDPE which should resolve the break issues. By relocating the main, there would be approximately 56,000 additional lineal feet of service leads and there is a minimal reduction in the lineal footage of force main (570'). This alternative alone does not remove or reduce inflow and infiltration in the system, nor does it address the need for pump replacement or sludge removal at the individual homes; but could be combined with other alternatives listed below. The construction cost for this alternative is $2,005,526 and a detailed breakdown can be found in Appendix D. The annual operation and maintenance cost for this alternative would be less than the current costs since the emergency pumping costs would be significantly reduced if not eliminated and the service lead repair costs would be significantly reduced if not eliminated.

3. Replace the STEP systems with grinder pump stations.
   This alternative could be used in conjunction with Alternative 1 or 2. By replacing the existing septic tanks and pumps, any sources of inflow/infiltration into the existing tanks would be eliminated as the grinder cans are sealed systems. This would also replace the existing gray water pumps with grinder pumps and up to date technology and which would address the pump replacement costs that the system are facing now along with screen plugging issues. The pumping costs for cleaning the solids out the existing tanks on a periodic basis would also be eliminated. The new grinder pumps have a seven to ten year life expectancy. This alternative alone does not address the hydraulic issues in the force main or the service lead deficiencies. The construction cost for this alternative is $1,698,750 and a detailed breakdown can be found in Appendix D. The annual operation and maintenance cost for this alternative would be slightly less initially than the current costs since all of the pumps would be replaced at once and would not have to be budgeted over the next few years. Also, the septic tank pumping at the individual homes would be eliminated and the emergency pumping may be reduced slightly due to the I/I removal at the tanks. The electrical usage should be the same for a grinder pump as a STEP pump.

4. Replace the pumps within the existing septic tanks with grinder pumps.
   This alternative could be used in conjunction with Alternative 1 or 2. By replacing the existing pumps with grinder pumps, this would reduce or eliminate the need for cleaning the solids out of the existing tanks on a periodic basis and would address the pump replacement costs for approximately the next ten years. This alternative does not correct any I/I issues at the existing tanks and does not address the hydraulic issues in the force main or the service lead deficiencies. The construction cost for this alternative is $833,500 and a detailed breakdown can be found in Appendix D. The annual operation and maintenance cost for this alternative would be slightly less initially than the current costs since all of the pumps would be replaced at once and would not have to be budgeted over the next few years.

5. Inflow removal program.
   This alternative would involve home by home inspections of sump pump connections, water softeners, roof drains and foundation drains into the STEP tanks. This would also include an inspection of the STEP tanks for any cracks or other defects that are allowing groundwater or storm water into the system. This home by home inspection would be time consuming and difficult. The issue then becomes who is responsible for the cost of the removals and repairs. One option would be that the district assumes the costs associated directly with the tank and the homeowner assumes the costs associated with the piping to the tank. However, if the problem was on the homeowner's side, this would require the homeowner to hire a contractor to perform the work at their cost along with a follow up inspection to ensure that the work was completed. This alternative would reduce the wet weather flows into the system that have required emergency

pumping in the past. There is no guarantee that enough inflow and infiltration would be removed to eliminate the need for emergency pumping. This alternative would be administratively challenging and a long process that may require filing ordinance violations and fines in order to get the homeowners to comply. This alternative also does not address the hydraulic issues associated with dry weather flows, pump replacement, or service lead deficiencies. The construction cost for this alternative is $619,200 and a detailed breakdown can be found in Appendix D. This construction estimate does not include the work identified as the homeowner's responsibility. The annual operation and maintenance cost for this alternative would be slightly less initially than the current costs due to less emergency pumping needed due to I/I removal.

6. Do nothing.
   This alternative has the system continuing status quo with the increasing emergency pumping costs as inflow/infiltration problems continue to get worse and new sources of inflow and infiltration continue to develop due to aging facilities. There are also ongoing pump replacement costs, labor costs associated with service lead breaks and pump maintenance. The collection system has a useful life as does anything, and will ultimately need replacement, and until then will require increasing repairs. There are no construction costs for this alternative, but the operation and maintenance costs will continue to increase as shown in Appendix D.

III. Treatment System

The existing treatment system consists of two 2500 gallon settling tanks and two 2000 gallon dosing tanks followed by 10 disposal fields which are used in rotation. Normal operation consists of the wastewater entering the two 2500 gallon settling chambers that then overflows to two 2000 gallon dosing chambers where gravity flow is then distributed sequentially over the ten disposal fields through actuated valves. The existing system was based on 40,000 gallons per day at an application rate of 0.75 gpd/sft. The NRCS web soil survey shows the soil type at the treatment site to be classified as Fox Sandy Loam, 2 to 6 percent slopes (FoB). This soil type consists of sandy loam for the first 13" and then sandy clay loam down to 36". However, based on soil boring data, clean sands were present. There are currently 183 connections but there are 191 properties in the assessment district. So designing for full buildout at 260 gallons/day, this equates to 49,660 gallons per day. With the higher design flow rate a drainage area of 66,500 sft is recommended. An undersized system can result in overloading of the soils, which can lead to permit violations and premature failure of the system. Field #2 is a concern in that the wastewater is currently surfacing demonstrating failure and it is currently isolated.

There has been a history of the discharge permit problems. The original discharge permit was issued in 1988 and the application to renew was submitted in 1996. However due to permit limit exceedences for inorganic nitrogen, sodium and chloride a variance had to be requested and was granted in 1998. The next application to renew the discharge permit

was submitted in 2002. MDEQ requested additional information and allowed the facility to operate on an extension of the expired permit until February 2009. The renewal for the current permit needs to be submitted by September 2011 as it will expire in March 2012. It has been demonstrated that the existing system vents to a stream. It is because of this, that the MDEQ has granted the permit variances.

The current permit contains a maximum daily phosphorus limit of 1 mg/L. Over the last eight years, there were 11 exceedences of the phosphorus limit primarily from MW-E (6 exceedences) and MW-H (4 exceedences). There have also been high levels of sodium, nitrogen and chlorides. The maximum daily limit of sodium is 150 mg/L. All values for MW-G exceed this limit and all but 5 (out of 36) for MW-F were exceeded. MW-E was consistently under this limit and MW-H exceeded one third of the time. The maximum daily limit for chloride is 250 mg/L. MW-E was consistently below this limit while MW-G and F were consistently above. MW-H exceeded this limit 2/3rds of the time. These exceedences have delayed permit renewals and have required permit variances. The high sodium and chloride levels can be attributed to home water softeners being connected to the sewer system. Through public education, a number of these systems have been disconnected. However, the system continues to exceed the permit limits for these parameters. The biggest concern is that the MDEQ could pull the discharge permit at any time due to the variances and violations, leaving the Tyrone Lake Sanitary Sewer System in an emergency disposal situation.

Treatment System Alternatives

Several alternatives were considered to correct the problems with the treatment system.

1. Replace the existing drainage fields on the existing treatment property.
   This alternative replaces the 10 existing drainage fields on the existing treatment property. There is adequate land at the existing treatment site to replace the existing fields which may have become overloaded over time. Additional drainfields would be constructed to reduce the excessive loadings and additional monitoring wells will be required. The construction cost for this alternative is $894,597 and a detailed breakdown can be found in Appendix D. The annual operation and maintenance cost for this alternative would be the same as the current costs as there really is no change to the current operating practices.

2. Replace the existing laterals within the existing drainage fields.
   This alternative replaces the 10 existing drainage fields on the existing treatment property within the existing treatment field areas. The thought is that instead of constructing whole new drainage fields, new laterals would be installed between the existing laterals and continue to use the existing distribution mains. This maintains the remainder of the land for future use. Additional drain fields would be constructed to reduce the excessive loadings and additional monitoring wells will be required. This may not provide the desired treatment since the existing drain field areas may not be able to provide the required treatment due to years of high usage. The actuated valves would have to be replaced with a new design. The current arrangement is subject to condensation leading to premature failure where the valves are only lasting five to eight years. The construction cost for this

alternative is $795,768 and a detailed breakdown can be found in Appendix D. The annual operation and maintenance cost for this alternative would be the same as the current costs as there really is no change to the current operating practices.

3. Replace the existing treatment system with wastewater treatment lagoons with a surface water discharge.
This alternative would require a surface water discharge instead of the existing groundwater discharge which is in violation and is at risk of not getting renewed without major improvements. There is an available drain located in close proximity to the existing treatment site that could be used as an outlet for a surface water discharge. The proposed lagoon system would consist of two cells of approximately 4.5 acres each. There is adequate area on the existing treatment site to construct a new lagoon system while keeping the existing drain fields in operation. NPDES discharge limits would have to be requested from the MDEQ to determine if they could be met with a facultative lagoon system or whether or not advanced treatment would be required. This alternative would require a licensed operator which the Livingston County Drain Commissioner's office has on staff, so no additional personnel would be required. Lagoon systems require little maintenance and the operation and maintenance costs are very low. The construction cost for this alternative is $2,336,576 and a detailed breakdown can be found in Appendix D. This construction cost does not include advanced treatment. The annual operation and maintenance cost for this alternative would be slightly lower than the current costs. The same inspection frequency could be maintained or possibly reduced. The surface water permit fees are slightly less as are analytical fees as they only have to be done twice a year for one sample instead of quarterly for four locations.

4. Replace the existing treatment system with a mechanical treatment plant with surface water discharge.
This alternative would require a surface water discharge instead of the existing groundwater discharge which is in violation and is at risk of not getting renewed without major improvements. There is an available drain located in close proximity to the existing treatment site that could be used as an outlet for a surface water discharge. The proposed treatment plant would consist of a package treatment plant system given the low flows of approximately 50,000 gpd. There is adequate area on the existing treatment site to construct a treatment plant while keeping the existing drain fields in operation. However, the construction of a wastewater treatment plant could preclude the district from utilizing the property for future development or lake dredging spoils deposition. NPDES discharge limits would have to be requested from the MDEQ to determine what treatment process steps are needed to meet the required limits. A mechanical plant would require a special licensed operator. The Livingston County Drain Commissioner's office has staff that may be eligible to be licensed for this facility. The construction cost for this alternative is $2,940,800 and a detailed breakdown can be found in Appendix D. The annual operation and maintenance

cost for this alternative would be much higher than the current costs. There would be additional electric, analytical, labor, utility costs, sludge disposal, etc.

5. Abandon the existing treatment system and connect to the Livingston County Regional System.
There is a force main that runs along the east side of US-23 that transports wastewater collected from several areas in Livingston County to the Genesee County Wastewater Treatment Plant for treatment and disposal. This option would abandon the existing treatment system and construct a pump station to transport the wastewater from the Tyrone Lake collection system to the regional force main. The connection point to system would be at the Cider Mills Crossing. With this alternative, the issues with the groundwater discharge permit violations would be eliminated. This alternative could also free up the use of this property for development or sale, which could defray the costs of a sewer improvement project. The land could also be utilized for lake dredging soils deposition. The construction cost for this alternative is $4,363,006 and a detailed breakdown can be found in Appendix D. The connection fee for Hartland Township is $8,090.05 and the connection fee for Tyrone Township is $12,500. The annual operation and maintenance cost for this alternative would be higher than the current costs due to the treatment fees to the County. At $6.29/1000 gallons, there would be costs of roughly $114,000 per year and this does not include the collection system costs that would be in addition to these costs for the Tyrone Lake customers.

6. Do nothing.
This alternative is not a feasible alternative for the treatment system. Without some improvements, the system will continue to violate the groundwater discharge permit and risk permit revocation. This could then result in fines and penalties and then the MDEQ will be forced to take action. Therefore, it is only a matter of time before something has to be done and it is recommended that a proactive approach be taken to address the problems rather than waiting for the situation to get worse.

IV. Financing Alternatives

There are several alternatives for financing the proposed solution; conventional bonds, State Revolving Fund (SRF) and USDA Rural Development. Conventional bonds are typically 20 year loans at an interest rate of approximately 6%. These loans can be obtained relatively quickly, as no application is required as with the other two options. However, the higher interest rate can be financially challenging for some communities.

The SRF program through the Michigan Department of Environmental Quality is a low interest (2.5%) 20 year loan program. This financing program requires a lengthy in-depth application that requires an engineering report, environmental clearances, public participation and hearings. This application is submitted by July 1 each year for review and scoring. Based on the scoring of all of the projects received, a prioritization list is issued (September) and funding is provided starting from the top of the list (highest scoring) down until available funding is depleted. In the last couple of years, there have

been a number of communities who have had to wait until the next funding year to receive financing. Therefore, if the project has to be completed under a tight or fixed timeframe, this would not be the recommended funding source. Recently, with the American Recovery Act money (ARRA), there was principal forgiveness (which equates to grants) for approved projects. It is not known if this will continue into FY 2011 or beyond, which would be the first available year of financing for this project.

The USDA Rural Development program offers 40 year loans at 3.5% interest rates for sanitary sewer projects. This program also requires a lengthy, in-depth application that requires an engineering report and environmental clearances. This application can be submitted at any time during the year and there is money readily available for financing. There is grant money also available based on income and affordability guidelines. This program is financially attractive due to the longer loan period that provides for lower annual payments. However, with a loan spread out over a longer period, the present worth cost is significantly higher. There are no penalties for early loan payoff with this program. One of the determining factors for grant dollars is the community's Median Household Income (MHI). In general, if the customers are paying more than 1.5% of the MHI for a service, RD may provide grant dollars to bring the user costs to less than 1.5%. The MHIs for Hartland and Tyrone Townships are very high - $75,994 and $75,908 respectively, which means that unless the proposed alternative is more than $284/qtr, then grant money is not likely.

VI. Recommendations

At a minimum, the treatment system should be addressed to correct the existing treatment deficiencies and permit violations. Given the history of problems with the groundwater discharge permit, the fact that the land has been used for treatment for 20 years, and that there are areas nearing failure, the soils onsite may no longer be suitable for subsurface irrigation as shown by high phosphorus levels at the north and south ends of the site. Even if new and additional areas were used for the drain fields, it cannot be said with certainty that the permit limits could be achieved due to prior usage and loadings. This leaves Alternatives 3, 4 and 5 as the feasible alternatives. Homeowners currently pay approximately $420/year in O&M costs. The following summarizes the costs associated with these three alternatives.

Treatment Options

Alternative	Total Project Cost	O&M Cost	Total Annual Cost per REU with Bond	Total Annual Cost/REU with SRF	Total Annual Cost/REU with RD
3 – Lagoons	$2,336,576	$68,628	$1,488	$1,194	$973
4 – Plant	$2,940,800	$179,725	$2,383	$2,013	$1,735
5 – Regional	$4,363,006	$174,687	$3,033	$2,484	$2,071

Based on the above, the lagoon option is the most financially feasible alternative, especially through Rural Development.

Replacing the treatment system would address the immediate issues at hand, but consideration should also be given to the collection system issues. Given the variety of problems that exist in the collection system, a combination of alternatives would be recommended as the most complete solution to the problems in the collection system. It is recommended that Collection System Alternatives 1 and 3 be implemented. This includes the replacement of the undersized sections of the force main to correct the hydraulic problems and to replace the existing service leads which are the source of a large number of breaks and excessive maintenance due to the materials of construction. This would be combined with Alternative 3 which replaces the existing STEP systems with grinder pump units which corrects some of the inflow and infiltration issues along with pump replacement and the elimination of solids pumping out of the septic tanks. The combination of these two collection system alternatives totals a project cost of $2,492,077.

The following summarizes the costs associated with these alternatives.

Alternative	Total Project Cost	O&M Cost	Total Annual Cost per REU with Bond	Total Annual Cost/REU with SRF	Total Annual Cost/REU with RD	20 year Present Worth
CS1 & 3	$2,492,077	$73,400	$1,588	$1,275	$1,039	$3,542,074
CS1 +TS3	$3,129,903	$63,628	$1,839	$1,445	$1,149	$4,094,267
CS1&3 +TS3	$4,828,653	$60,628	$2,632	$2,024	$1,567	$5,747,548

APPENDIX A – COLLECTION SYSTEM MAP

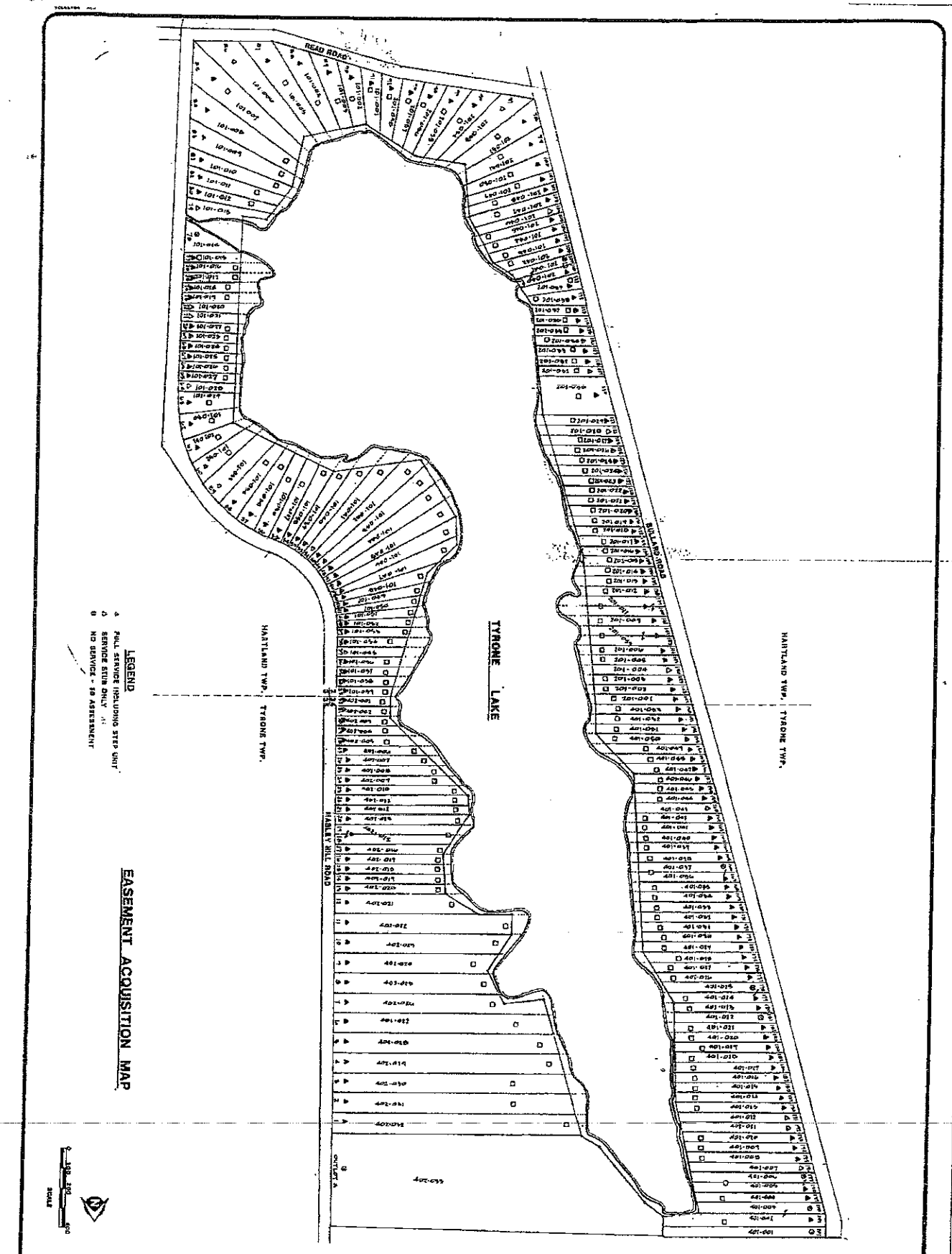


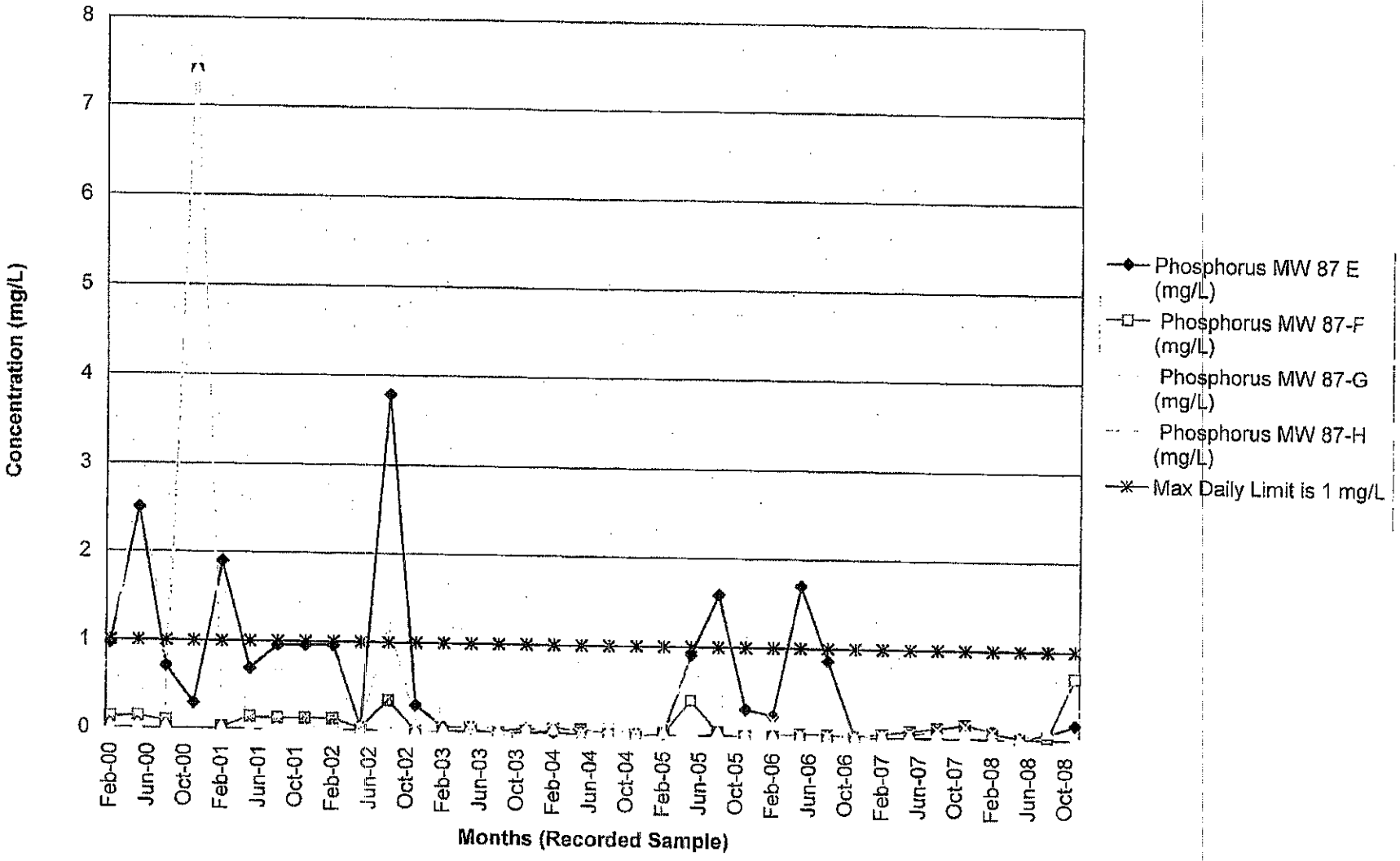
EXHIBIT A	DATE: APRIL 24, 1997	DATE / REVISION: 4-24-97 ADDED STEP UNIT & STUB LOCATIONS	WASTEWATER COLLECTION AND TREATMENT SYSTEM FOR TYRONE LAKE
DRAWING NO.	FILE NO. 6907-16X	Progressive	EASEMENT ACQUISITION MAP

TYRONE LAKE SANITARY DRAIN DRAINAGE DIST
RICHARD RUCINSKI-CHAIRMAN
204 S. HIGHLANDER WAY
HOWELL, MICHIGAN 48843

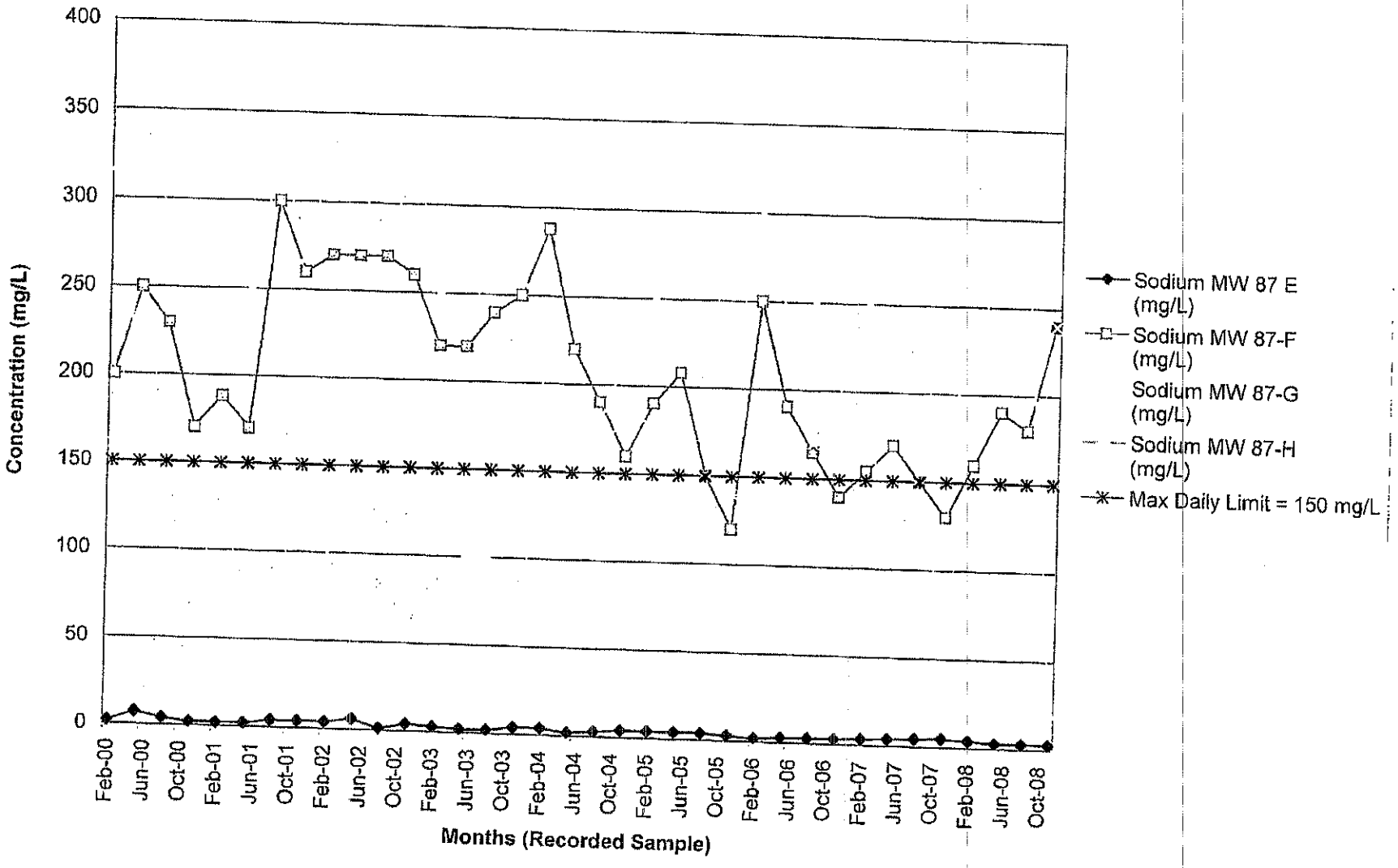
Progressive Progressive Engineering Consultants of Grand Rapids, Inc.

APPENDIX B – GROUNDWATER MONITORING DATA AT TREATMENT SITE

Phosphorus Test Results: Feb 2000 - Nov 2008



Sodium Test Results: Feb 2000 - Nov 2008



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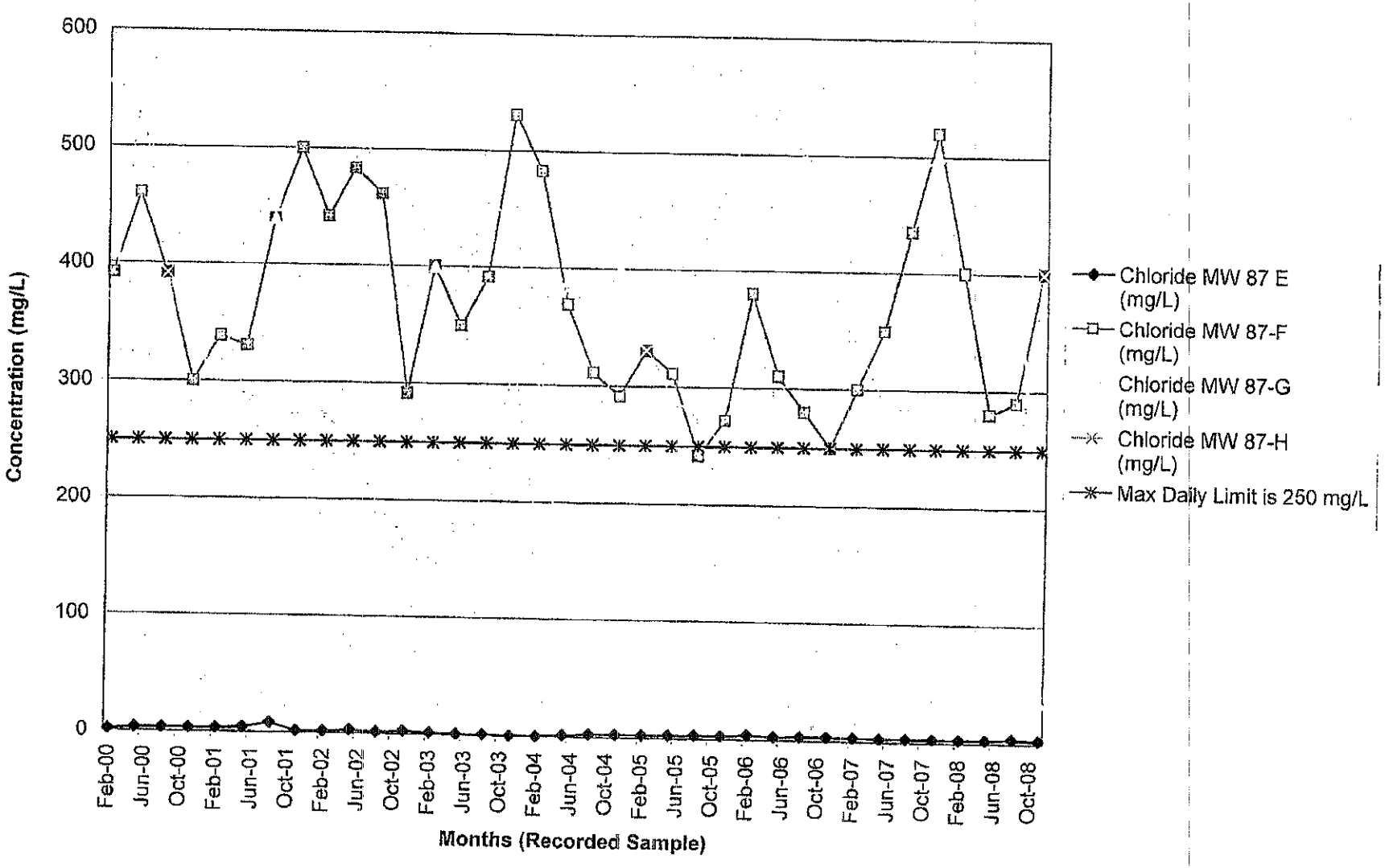


APPENDIX C – CURRENT DISCHARGE PERMIT

PERMIT NO. GW1810203

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

GROUNDWATER DISCHARGE PERMIT

In compliance with the provisions of Michigan's Natural Resources and Environmental Protection Act, 1994 P.A. 451, as amended (NREPA), Part 31, Water Resources Protection, and Part 41, Sewerage Systems,

Livingston County Drain Commission
2300 East Grand River, Suite 105
Howell, Michigan 48843

is authorized to discharge 40,000 gallons per day, 14,600,000 gallons per year of sanitary sewage from the Livingston County Drain Commission located at

6335 Mabley Hill Road
Fenton, Michigan 48430

designated as Livingston County Drain Commission

to the groundwater of the State of Michigan in accordance with effluent limitations, monitoring requirements and other conditions set forth in this permit.

Rule Authorization:	**2218**
Wastewater Type:	**Sanitary sewage**
Wastewater Treatment Method:	**Plain Clarification**
Wastewater Disposal Method:	**Subsurface Tilefields**

The issuance of this permit does not authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other Michigan Department of Environmental Quality (Department) permits, or approvals from other units of government as may be required by law.

This permit is based on a complete application submitted on December 4, 2002.

This permit takes effect on March 1, 2009. The provisions of this permit are severable. After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term in accordance with applicable laws and rules.

This permit and the authorization to discharge shall expire at midnight, March 1, 2012. In order to receive authorization to discharge beyond the date of expiration, the permittee shall submit an application which contains such information, forms, and fees as are required by the Department by September 3, 2011.

Issued February 17, 2009 .

James R. Janiczek, Chief
Groundwater Permits Unit
Permits Section, Water Bureau

PERMIT FEE REQUIREMENTS

In accordance with Section 324.3122 of the NREPA, the permittee shall make payment of an annual permit fee to the Department for each December 15th the permit is in effect regardless of occurrence of discharge. The permittee shall submit the fee in response to the Department's annual notice. The fee shall be postmarked by March 1st for notices mailed by January 15th. The fee is due no later than 45 days after receiving the notice for notices mailed after January 15th.

CONTACT INFORMATION

Unless specified otherwise, all contact with the Michigan Department of Environmental Quality (the "Department") required by this permit shall be made to the Lansing District Supervisor of the Water Bureau. The Lansing District Office is located at Constitution Hall, 525 West Allegan, 4th Floor-North, P.O. Box 30242, Lansing, Michigan 48909, Telephone: 517-335-4598, Fax: 517-241-3571.

CONTESTED CASE INFORMATION

Any person who is aggrieved by this permit may file a sworn petition with the Office of Administrative Hearings of the Michigan Department of Labor and Economic Growth, setting forth the conditions of the permit which are being challenged and specifying the grounds for the challenge. The Department of Labor and Economic Growth may reject any petition filed more than 60 days after issuance as being untimely.

SPECIAL INSTRUCTIONS/NOTIFICATIONS

This permit does not authorize or approve the construction or modification of any wastewater treatment system, physical structures or facilities. Approval for such construction must be as follows:

1. For a publicly owned treatment work (POTW), or a private system that is servicing the public, approval must be by permit issued under Part 41 of the NREPA
2. for a mobile home park, approval shall be pursuant to MCL 125.2312.
3. for a campground or marine, approval shall be from the Water Bureau, Michigan Department of Environmental Quality
4. For a hospital, nursing home or extended care facility, approval shall be from the Division of Health Facilities and Services, Michigan Department Consumer and Industry Services, upon request.

PART I

1. Effluent Limitations

During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee is authorized to discharge a maximum of 40,000 gallons per day, 14,600,000 gallons per year, of sanitary sewage from the monitoring points listed below to the groundwater in the NE ¼ of the SE ¼, Section 34, T4N, R6E, Tyrone Township, Livingston County, Michigan. The discharge shall be limited and monitored by the permittee as specified below.

Parameter	Maximum Daily Limit	Units	Frequency of Analysis	Sample Type
INFLUENT				
Monitoring Point **IF-1**				
Flow	(report)	GPD	Daily	Report Total
EFFLUENT				
Monitoring Point **EQ-1**				
Flow	40,000	GPD	Daily	Report Total
Flow	14,600,000	GPY	Annually	Calculation
Total Inorganic Nitrogen	(report)	mg/l	Quarterly	Calculation
Ammonia Nitrogen	(report)	mg/l	Quarterly	Grab
Nitrate Nitrogen	(report)	mg/l	Quarterly	Grab
Nitrite Nitrogen	(report)	mg/l	Quarterly	Grab
pH	(report)	S.U.	Quarterly	Grab
Chloride	(report)	mg/l	Quarterly	Grab
Sodium	(report)	mg/l	Quarterly	Grab
Total Phosphorus	(report)	mg/l	Quarterly	Grab
LAND APPLICATION				
Monitoring Point **LA-1**				
Application Rate *	TBD	gal/day/ft2	Daily	Calculation

* See Part I, Section 4.b of this permit

a) Total Inorganic Nitrogen
The daily maximum value for total inorganic nitrogen shall be reported as the sum of the daily maximum values for ammonia nitrogen, nitrate nitrogen, and nitrite nitrogen.

b) Sampling Locations
Influent flow, effluent flow, and land application rate shall be measured in accordance with the approved sampling plan. The location and method of collecting and analyzing effluent quality and soil samples shall be in accordance with the approved sampling plan. The Department may approve alternate sampling locations which are demonstrated by the permittee to be representative.

PART I

2. Groundwater Monitoring and Limitations (Upgradient)

During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee shall sample the groundwater from the hydraulically upgradient groundwater monitor wells MW-E as described below:

Parameter	Limit	Units	Frequency of Analysis	Sample Type
Static Water Elevation	(report)	USGS-Ft	Quarterly	Measured
pH	(report)	S.U.	Quarterly	Grab
Specific Conductance	(report)	umhos/cm	Quarterly	Grab
Total Inorganic Nitrogen	(report)	mg/l	Quarterly	Calculation
Ammonia Nitrogen	(report)	mg/l	Quarterly	Grab
Nitrate Nitrogen	(report)	mg/l	Quarterly	Grab
Nitrite Nitrogen	(report)	mg/l	Quarterly	Grab
Chloride	(report)	mg/l	Quarterly	Grab
Sodium	(report)	mg/l	Quarterly	Grab
Total Phosphorus	(report)	mg/l	Quarterly	Grab
Dissolved Calcium	(report)	mg/l	Annually	Grab
Dissolved Iron	(report)	mg/l	Annually	Grab
Dissolved Magnesium	(report)	mg/l	Annually	Grab
Dissolved Manganese	(report)	mg/l	Annually	Grab
Dissolved Potassium	(report)	mg/l	Annually	Grab
Dissolved Oxygen	(report)	mg/l	Annually	Grab
Bicarbonate	(report)	mg/l	Annually	Grab
Sulfate	(report)	mg/l	Quarterly	Grab

a) Sampling Locations

Groundwater samples shall be taken in each of the specified monitoring wells and in the specific month of each quarter in accordance with the sampling plan approved by the Department. The Department may approve alternate sampling locations which are demonstrated by the permittee to be representative.

b) Total Inorganic Nitrogen at Groundwater Monitoring Points

The value for total inorganic nitrogen shall be reported as the sum of the values for ammonia nitrogen, nitrate nitrogen, and nitrite nitrogen.

PART I

3. Groundwater Monitoring and Limitations (Downgradient)

During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee shall sample the groundwater from hydraulically downgradient groundwater monitor wells. The discharge of treated wastewater shall not cause the groundwater in the newly proposed monitor wells MW-J and MW-K (see Part I – Section 4 of this permit) to exceed the limitations below.

Parameter	Maximum Daily Limit	Units	Frequency of Analysis	Sample Type
Static Water Elevation	(report)	USGS-Ft	Quarterly	Measured
pH (Minimum)	6.5	S.U.	Quarterly	Grab
pH (Maximum)	9.0	S.U.	Quarterly	Grab
Specific Conductance	(report)	umhos/cm	Quarterly	Grab
Total Inorganic Nitrogen	(report)	mg/l	Quarterly	Calculation
Ammonia Nitrogen	5.0	mg/l	Quarterly	Grab
Nitrate Nitrogen	(report)	mg/l	Quarterly	Grab
Nitrite Nitrogen	0.5	mg/l	Quarterly	Grab
Chloride	250	mg/l	Quarterly	Grab
Sodium	150	mg/l	Quarterly	Grab
Total Phosphorus	1.0	mg/l	Quarterly	Grab
Dissolved Calcium	(report)	mg/l	Annually	Grab
Dissolved Iron	(report)	mg/l	Annually	Grab
Dissolved Magnesium	(report)	mg/l	Annually	Grab
Dissolved Manganese	(report)	mg/l	Annually	Grab
Dissolved Potassium	(report)	mg/l	Annually	Grab
Dissolved Oxygen	(report)	mg/l	Annually	Grab
Bicarbonate	(report)	mg/l	Annually	Grab
Sulfate	250	mg/l	Quarterly	Grab

a) Sampling Locations
Groundwater samples shall be taken in each of the specified monitoring well in accordance with the sampling plan approved by the Department. The Department may approve alternate sampling locations which are demonstrated by the permittee to be representative.

b) Total Inorganic Nitrogen at Groundwater Monitoring Points
The daily maximum value for total inorganic nitrogen shall be reported as the sum of the daily maximum values for ammonia nitrogen, nitrate nitrogen, and nitrite nitrogen.

4. Schedule of Compliance

The permittee shall comply with the following schedule. Submittals shall comply with Rule 323.2218 which may be obtained via the Internet at http://www.deq.state.mi.us/documents/deq-wmd-gwp-part22.pdf. All submittals shall be to the Department.

a) On or before 60 days of the issuance of this permit, the permittee shall submit for review and approval an updated Discharge Management Plan pursuant to Rules 2233-2236.
b) On or before 60 days of the issuance of this permit, the permittee shall submit for review and approval an updated Operations and Maintenance Manual pursuant to Rule 2218(4)(b).
c) On or before 60 days of the issuance of this permit, the permittee shall submit for review and approval the updated Sampling and Analysis Plan pursuant to Rule 2223(2).

PART I

d) On or before 60 days after the issuance of this permit, the permittee shall certify that a Restrictive Deed Covenant has been filed with the appropriate register of deeds that prevents the installation and use of a potable water well without the approval of the Department. The Restrictive Covenant must cover the dischargers property affected by the discharge and all property affected by the discharge not owned by the discharger hydraulically downgradient to the point of venting to surface water.

5. Operation and Maintenance Manual

The permittee is required to develop an Operation and Maintenance Manual. A guidance document is available via the Internet at: http://www.deq.state.mi.us/documents/deq-wmd-gwp-Part22GuidshtVI.pdf.

6. Operator Certification

The permittee shall have the waste treatment facilities under direct supervision of an operator certified at the appropriate level for the facility certification by the Department, as required by Sections 3110 and 4104 of the NREPA.

7. Submittal Requirements for Self-Monitoring Data

The permittee shall submit self-monitoring data monthly on the Department's Compliance Monitoring Report (CMR) for each calendar month of the authorized discharge period to:

NMS-CMR-Data Entry-Groundwater, Water Bureau, Michigan Department of Environmental Quality P.O. Box 30273, Lansing, Michigan, 48909-7773.

AND

Lansing District Office, Water Bureau, Michigan Department of Environmental Quality, Constitution Hall, 525 West Allegan, 4th Floor-North, P.O. Box 30242, Lansing, Michigan 48909

The forms shall be postmarked no later than the 15th day of the month following each month of the authorized discharge period(s).

Alternative Daily Discharge Monitoring Report formats may be used if they provide equivalent reporting details and are approved by the Department.

8. Facility Operation and Maintenance

During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee shall comply with the inspection, operation and maintenance program requirements specified below.

Location	Condition	Measurement Frequency	Sample Type
Drainfields	Ponding	Weekly	Visual Observation
	Outbreaks	Weekly	Visual Observation
	Odors	Weekly	Olfactory Observation

9. General Conditions

a) The discharge shall not be, or not be likely to become, injurious to the protected uses of the waters of the state.
b) The discharge shall not cause runoff to, ponding on, or flooding of adjacent property, shall not cause erosion, and shall not cause nuisance conditions.
c) The point of discharge shall be located not less than 100 feet inside the boundary of the property where the discharge occurs, unless a lesser distance is specifically authorized in writing by the Department.
d) The discharge shall not create a facility as defined in Part 201, Environmental Response, of the NREPA.

10. Other Conditions

a) **Basis of Design** - The discharge shall be treated in accordance with the approved basis of design pursuant to Rule 2218(2).

PART I

b) Wastewater Characterization - The wastewater being treated shall be of the same chemical, biological, and physical characteristics as described in the characterization required pursuant to Rule 2220.

c) The tile fields must be designed and constructed in accordance with the provisions of the publication entitled "Michigan Criteria for Subsurface Sewage Disposal" and approved by the local county, district, or city health department that has jurisdiction of the Department.

d) Before the sludge volume occupies 25 percent of the holding tank capacity, septic tanks shall be pumped by a septage hauler licensed pursuant to Part 117, Septage Waste Servicers, of the NREPA. Septage shall be disposed of in accordance with Part 117.

11. Discharge Management Plan (DMP)

a) A land treatment system shall be designed, constructed, and operated as follows:

(1) The system shall be designed and constructed to prevent surface runoff from either entering or exiting the system.

(2) The system shall be designed and constructed to provide even distribution of wastewater during application. A header ditch, where used, shall be designed and constructed to allow for complete drainage after each wastewater loading or shall be lined to prevent seepage.

(3) If vegetative cover is utilized and is considered part of the overall treatment system, then the design and construction of the system shall allow for the mechanical harvesting of vegetative cover.

(4) The system shall be designed, constructed, and operated to allow an appropriate loading cycle. An appropriate loading cycle allows time between loadings for all of the following:
(a) Soil organisms to biologically decompose organic constituents in the wastewater.
(b) Organic solids on the soil surface to decompose.
(c) The soil to become aerated.
(d) Vegetative cover to utilize available nutrients provided through the application of the wastewater.
(e) Soil conditions to become unsaturated and aerobic.
(f) Harvesting operations to occur at appropriate times.

b) The design hydraulic loading or application rate, whether daily, monthly, or annual, shall not be more than one of the following:

(1) Three percent of the permeability of the most restrictive soil layer within the solum over the area of the discharge when determined by either the cylinder infiltration method or air entry permeameter test method.

(2) Seven percent of the permeability of the most restrictive soil layer within the solum over the area of the discharge as determined by the saturated hydraulic conductivity method.

(3) Twelve percent of the permeability of the most restrictive soil layer within the solum over the area of the discharge as determined by the basin infiltration method.

(4) If published information is utilized, the discharger shall determine the methodology used to measure the reported hydraulic conductivity. If the hydraulic conductivity is given as a range of expected values, then a discharger shall use the minimum value given the most restrictive soil layer within the solum when calculating the hydraulic loading or application rate.

c) The system shall be designed, constructed, and operated so as to prevent the development of sodic conditions within the solum of the discharge area. Sodic conditions are considered to exist in the solum when the exchangeable sodium percentage, which is the percentage of the cation exchange capacity of a soil occupied by sodium, is more than 15 percent.

d) If phosphorus adsorption within the solum or unsaturated soil column is part of the overall treatment process, then the system shall be designed as follows:

(1) The available phosphorus adsorptive capacity of the solum or unsaturated soil column from within the discharge area shall be sufficient to provide the necessary treatment to ensure that the applicable limit established in the permit is not exceeded for the duration of the permit.

(2) The loading cycle shall be designed so as to provide the necessary contact time within the solum or unsaturated soil column required for phosphorus to be removed from the applied wastewater through adsorption processes.

(3) The available phosphorus adsorptive capacity of the discharge area shall be determined through either of the following methods:
(a) By subtracting phosphorus levels of the unsaturated soil column, determined through on-site Bray-P1 analysis, from published phosphorus adsorption capacity data for the solum found within the discharge area.
(b) By subtracting phosphorus levels of the unsaturated soil column, as determined through on-site Bray-P1 analysis, from the phosphorus adsorption maximum as determined through Langmuir isotherm analysis of on site soils, after adjustments for the concentration of phosphorus in the effluent and fraction of utilization within the solum are made.

e) All of the following operation and maintenance requirements shall be met:
(1) Portions of the wastewater distribution system shall be capable of being taken out of service for maintenance and other operational activities and to provide rest to portions of the irrigation area without disrupting applications to other areas of the system.
(2) All areas within a system shall be accessible for maintenance equipment.
(3) For slow rate and overland flow treatment systems, the pH of the plow layer within the discharge area shall be maintained between 6.0 and 7.5 standard units.

f) The discharge to a land treatment system shall be limited so that the discharge volume combined with the precipitation from a 10-year frequency, 24-hour duration rainfall event does not overflow the designed discharge area.

g) If any modifications are made to the management practices or specifications for the land application of wastewater, including but not limited to changes in crops grown, yield goal for those crops, or supplemental fertilization provided by the permittee or a third party, the permittee shall submit a revised DMP on or before November 30 of the year prior to making the proposed change. Based on this submittal, the Department may modify this permit in accordance with applicable rules and laws.

12. Compliance Requirements

Compliance with all applicable requirements set forth in Parts 31 and 41 of the NREPA, and related regulations and rules is required. All instances of noncompliance with concentration limitations of effluent or groundwater shall be reported as follows.

a) If the facility is in a wellhead protection area, within 48 hours from the time the permittee becomes aware of the noncompliance, the permittee shall report noncompliance to the public water supply manager.

b) Within seven (7) days from the time the permittee becomes aware of the noncompliance, the permittee shall report, in writing, all instances of noncompliance. Written reporting shall include all of the following: 1) the name of the substance(s) for which a limit was exceeded; 2) the concentration at which the substance was found; and 3) the location(s) at which the limit was exceeded.

c) Within 14 days from the time the permittee becomes aware of the noncompliance, the permittee shall resample the monitoring point at which the limit was exceeded for the substance for which a limit was exceeded.

d) Within 60 days from the time the permittee becomes aware of the noncompliance, the permittee shall submit a written report that shall include all of the following: 1) the results of the confirmation sampling; 2) an evaluation of the cause for the limit being exceeded and the impact of that event to the groundwater; and 3) a proposal detailing steps taken or to be taken to prevent recurrence.

e) In accordance with applicable rules, the Department may require additional activities including, but not limited, to the following:
(1) Change the monitoring program, including increasing the frequency of effluent monitoring or groundwater sampling, or both.
(2) Develop and implement a groundwater monitoring program if one is not in place.
(3) If the discharge is in a designated wellhead protection area, assess the affects of the discharge on the public water supply system.
(4) Review the operational or treatment procedures, or both, at the facility.
(5) Define the extent to which groundwater quality exceeds the applicable criteria that would designate the site as a facility under Part 201.

(6) Revise the operational procedures at the facility.
(7) Change the design or construction of the wastewater operations at the facility.
(8) Initiate an alternative method of waste treatment or disposal.
(9) Remediate contamination to comply with the terms of Part 201, if applicable.

f) If the Department determines there is a change in groundwater quality from a normal operating baseline that indicates the concentration of a substance in groundwater may exceed an applicable limit, then the discharger shall take the following actions if required by the Department:
(1) Change the monitoring program, including increasing the frequency of effluent sampling or groundwater sampling, or both.
(2) Review the operational or treatment procedures, or both, at the facility.

13. Request for Discharge of Water Treatment Additives

In the event a permittee proposes to discharge water treatment additives (WTAs) to groundwater, the permittee shall submit a request to discharge WTAs to the Department for approval. Such requests shall be sent to the Surface Water Assessment Section, Water Bureau, Department of Environmental Quality, P.O. Box 30273, Lansing, Michigan 48909, with a copy to the Department contact listed on the cover page of this permit. Instructions to submit a request electronically may be obtained via the Internet (http://www.michigan.gov/deq and on the left side of the screen click on Water, Water Quality Monitoring, and Assessment of Michigan Waters; then click on the Water Treatment Additive List which is under the Information banner). Written approval from the Department to discharge such WTAs at specified levels shall be obtained prior to discharge by the permittee. Failure to obtain approval prior to discharging any WTA is a violation of this permit. Additional monitoring and reporting may be required as a condition for the approval to discharge the WTA. WTAs include such chemicals as herbicides used to kill weeds and grasses as part of lagoon maintenance.

A request to discharge WTAs to groundwater shall include all of the following:

a) product information:
(1) name of the product;
(2) Material Safety Data Sheet;
(3) product function (i.e. microbiocide, flocculants, etc.);
(4) specific gravity if the product is a liquid; and
(5) annual product use rate (liquids in gallons per year and solids in pounds per year);

b) ingredient information:
(1) name of each ingredient;
(2) CAS number for each ingredient; and
(3) fractional content by weight for each product;

c) the monitoring point from which the WTA is to be discharged;

d) the proposed WTA discharge concentration;

e) the discharge frequency (i.e., number of hours per day and number of days per year);

f) the type of removal treatment, if any, that the WTA receives prior to discharge;

g) relevant mammalian toxicity studies for the product or all of its constituents (if product toxicity data are submitted, the applicant shall provide information showing that the product tested has the same composition as the product listed under Item "a" above. Preferred studies are subchronic or chronic in duration, use the oral route of exposure, examine a wide array of endpoints and identify a no-observable-adverse-effect-level. Applicants are strongly encouraged to provide the preferred data. If preferred data are not available, then the minimum information needed is an oral rat LD50 study. In addition, an environmental fate analysis that predicts the mobility of the product/ingredients and their potential to migrate to groundwater may be provided.

PART I

h) If the discharge of the WTA to groundwater is within 1,000 feet of a surface water body, the following information shall also be provided:
   (1) a 48-hour LC50 or EC50 for a North American freshwater planktonic crustacean (either Ceriodaphnia sp., Daphnia sp., or Simocephalus sp.); and
   (2) the results of a toxicity test for one other North American freshwater aquatic species (other than a planktonic crustacean) that meets a minimum requirement of Rule 323.1057(2) of the Water Quality Standards.

Prior to submitting the request, the permittee may contact the Surface Water Assessment Section by telephone at 517-335-1180 or via the Internet at the address given above to determine if the Department has the product toxicity data required by Item "g" above. If the Department has the data, the permittee will not need to submit product toxicity data.

PART II

Definitions

This list of definitions may include terms not applicable to this permit.

Annual frequency of analysis refers to a calendar year beginning on January 1 and ending on December 31. When required by this permit, an analytical result, reading, value or observation must be reported for that period if a discharge occurs during that period.

Biosolids are the solid, semisolid, or liquid residues generated during the treatment of sanitary sewage or domestic sewage in a treatment works. This includes, but is not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment processes and a derivative of the removed scum or solids.

Bulk biosolids means biosolids that are not sold or given away in a bag or other container for application to a lawn or home garden.

By-Pass means any diversion from or bypass of facilities necessary to maintain compliance with the terms and conditions of this permit.

Class B Biosolids refers to material that has met the Class B pathogen reduction requirements or equivalent treatment by a Process to Significantly Reduce Pathogens (PSRP) in accordance with the Part 24 Rules. Processes include aerobic digestion, composting, anaerobic digestion, lime stabilization and air drying.

Daily concentration is the sum of the concentrations of the individual samples of a parameter divided by the number of samples taken during any calendar day. If the parameter concentration in any sample is less than the quantification limit, regard that value as zero when calculating the daily concentration.
For pH, report the maximum value of any individual sample taken during the month and the minimum value of any individual sample taken during the month.

Department means the Michigan Department of Environmental Quality.

Detection Level means the lowest concentration or amount of the target analyte that can be determined to be different from zero by a single measurement at a stated level of probability.

Flow Proportioned sample is a composite sample with the sample volume proportional to the effluent flow.

Furrow stream is the volume, in gallons per unit time, usually per minute, of wastewater discharged into the furrow.

GPD means gallons per day.

GPY means gallons per year.

Grab sample is a single sample taken at neither a set time nor flow.

MGD means million gallons per day.

Mg/l is a unit of measurement and means milligrams per liter.

Monthly frequency of analysis refers to a calendar month. When required by this permit, an analytical result, reading, value or observation must be reported for that period if a discharge occurs during that period.

POTW is a publicly owned treatment works.

Quantification level means the measurement of the concentration of a contaminant obtained by using a specified laboratory procedure calculated at a specified concentration above the detection level. It is considered the lowest concentration at which a particular contaminant can be quantitatively measured using a specified laboratory procedure for monitoring of the contaminant.

PART II

Quarterly frequency of analysis refers to a three month period, defined as January through March, April through June, July through September, and October through December. When required by this permit, an analytical result, reading, value or observation must be reported for that period if a discharge occurs during that period.

Report means there is no limit associated with the individual substance for the medium that is being sampled, that the permittee must only report the result of the laboratory analysis.

Weekly frequency of analysis refers to a calendar week which begins on Sunday and ends on Saturday. When required by this permit, an analytical result, reading, value or observation must be reported for that period if a discharge occurs during that period.

24-Hour Composite sample is a flow proportioned composite sample consisting of hourly or more frequent portions that are taken over a 24-hour period.

PART II

1. Start-up Notification

If the permittee will not discharge during the first 60 days following the effective date of this permit, the permittee shall notify the Department within 14 days following the effective date of this permit, and then 60 days prior to the commencement of the discharge.

2. Compliance Dates Notification

Within 14 days of every compliance date specified in this permit, the permittee shall submit a written notification to the Department indicating whether or not the particular requirement was accomplished. If the requirement was not accomplished, the notification shall include an explanation of the failure to accomplish the requirement, actions taken or planned by the permittee to correct the situation, and an estimate of when the requirement will be accomplished. If a written report is required to be submitted by a specified date and the permittee accomplishes this, a separate written notification is not required.

3. Notification of Changes in Discharge, Treatment or Facility Operations

If proposing to modify the quantity or effluent characteristics of the discharge or the treatment process for the discharge, the permittee shall notify the Department of the proposed modification prior to its occurrence. Significant modifications require the permittee to submit an application. A permit modification shall be processed in accordance with applicable rules and laws prior to implementation of the modification.

4. Transfer of Ownership or Control

In the event of any change in control or ownership of facilities from which the authorized discharge emanates, the permittee shall submit to the Department 30 days prior to the actual transfer of ownership or control a written agreement between the current permittee and the new permittee containing: 1) the legal name and address of the new owner; 2) a specific date for the effective transfer of permit responsibility, coverage and liability; and 3) a certification of the continuity of or any changes in operations, wastewater discharge, or wastewater treatment.

If the new permittee is proposing changes in operations, wastewater discharge, or wastewater treatment, the Department may propose modification of this permit in accordance with applicable laws and rules.

5. Representative Samples

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. Guidance on how to collect representative samples is contained in Guidesheet III, "Characterization of Wastewater", which is available via the Internet at http://www.deq.state.mi.us/documents/deq-wmd-gwp-P22GuidshtIII.pdf.

6. Test Procedures

Test procedures for the analysis of pollutants shall conform to regulations promulgated pursuant to either SW-846, 3rd edition, September 1986, "Test Methods for the Evaluation of Solid Waste, Physical-Chemical Methods", or Section 304(h) of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq), 40 CFR Part 136 - Guidelines Establishing Test Procedures for the Analysis of Pollutants, unless specified otherwise in this permit. Requests to use test procedures not defined here shall be submitted to the Department for review and approval.

The permittee shall periodically calibrate and perform maintenance procedures on all analytical instrumentation at intervals to ensure accuracy of measurements. The calibration and maintenance shall be performed as part of the permittee's laboratory Quality Control/Quality Assurance program.

7. Instrumentation

The permittee shall periodically calibrate and perform maintenance procedures on all monitoring instrumentation at intervals to ensure accuracy of measurements.

PART II

14. Bypass Prohibition and Notification

a) Bypass Prohibition - Bypass is prohibited unless:
   (1) bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
   (2) there were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass; and
   (3) the permittee submitted notices as required under 14.b. or 14.c. below.

b) Notice of Anticipated Bypass - If the permittee knows in advance of the need for a bypass, it shall submit prior notice to the Department, if possible at least ten (10) days before the date of the bypass, and provide information about the anticipated bypass as required by the Department. The Department may approve an anticipated bypass, after considering its adverse effects, if it will meet the three (3) conditions listed in 14.a. above.

c) Notice of Unanticipated Bypass - The permittee shall submit notice to the Department of an unanticipated bypass by calling the Department at the number indicated on the first page of this permit (if the notice is provided after regular working hours, use the following number: 1-800-292-4706) as soon as possible, but no later than 24 hours from the time the permittee becomes aware of the circumstances.

d) Written Report of Bypass - A written submission shall be provided within five (5) working days of commencing any bypass to the Department, and at additional times as directed by the Department. The written submission shall contain a description of the bypass and its cause; the period of bypass, including exact dates and times, and if the bypass has not been corrected, the anticipated time it is expected to continue; steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass; and other information as required by the Department.

e) Bypass Not Exceeding Limitations - The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of 14.a., 14.b., 14.c., and 14.d., above. This provision does not relieve the permittee of any notification responsibilities under Part II, Section **Error! Reference source not found.** of this permit.

f) Definitions
   (1) Bypass means the intentional diversion of waste streams from any portion of a treatment facility.
   (2) Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

15. Facilities Operation

The permittee shall, at all times, properly operate and maintain all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes adequate laboratory controls and appropriate quality assurance procedures.

16. Power Failures

In order to maintain compliance with the effluent limitations of this permit and prevent unauthorized discharges, the permittee shall either:

a) provide an alternative power source sufficient to operate facilities utilized by the permittee to maintain compliance with the effluent limitations and conditions of this permit; or
b) upon the reduction, loss, or failure of one or more of the primary sources of power to facilities utilized by the permittee to maintain compliance with the effluent limitations and conditions of this permit, the permittee shall halt, reduce or otherwise control production and/or all discharge in order to maintain compliance with the effluent limitations and conditions of this permit.

PART II

17. Containment Facilities

The permittee shall provide facilities for containment of any accidental losses of polluting materials in accordance with the requirements of the Part 5 Rules (Rules 324.2001 through 324.2009 of the Michigan Administrative Code). For a Publicly Owned Treatment Work (POTW), these facilities shall be approved under Part 41 of the NREPA.

18. Waste Treatment Residues

Residuals (i.e. solids, sludges, biosolids, filter backwash, scrubber water, ash, grit or other pollutants) removed from or resulting from treatment or control of wastewaters, shall be disposed of in an environmentally compatible manner and according to applicable laws and rules. These laws may include, but are not limited to, the NREPA, Part 31, Water Resources Protection; Part 55, Air Pollution Control; Part 111, Hazardous Waste Management; Part 115, Solid Waste Management; Part 121, Liquid Industrial Wastes; Part 301, Inland Lakes and Streams; and Part 303, Wetland Protection. Such disposal shall not result in any unlawful pollution of the air, surface waters or groundwater of the state.

19. Treatment System Closure

a) In the event that discharges from a treatment system are planned to be eliminated, the permittee shall do the following:
   (1) Eliminate all physical threats associated with discharge related facilities not later than five (5) days after use of the facility has ceased.
   (2) Not less than 75 days before cessation of discharge related activities, characterize any wastewater, sediments and sludges related to the discharge, pursuant to Rule 2226(4)(a)(i-iii).

b) Within 30 days of completing the characterization, the discharger shall submit a closure plan to the Department for review and approval that describes how the wastewater, sediments and sludges associated with the discharge will be handled in accordance with Part 31, Part 115, Part 111, or Part 201, as appropriate.

c) Closure activities must be initiated within 30 days of Department approval of the Closure Plan, and must be completed within one (1) year of approval of the Closure Plan.

d) If the groundwater exceeds a standard established by the Department that would result in the site qualifying as a facility under Part 201, then the discharger shall comply with the requirements of Part 201.

e) The Department may require post closure monitoring activities to evaluate the effectiveness of the closure activities. Any wastewater or residual disposal inconsistent with the approved plan shall be considered a violation of this permit. After proper closure of the treatment system, this permit may be terminated.

f) The discharger must certify completion of the approved closure plan. Certification shall be by a qualified person described as follows:
   (1) An engineer licensed under Act No. 299 of the Public Acts of 1980, as amended, being §339.101 et seq. Of the Michigan Compiled Laws, and known as the occupational code.
   (2) A professional geologist certified by the American Institute of Professional Geologists, 7828 Vance Drive, Suite 103, Arvada, Colorado 80003.
   (3) A professional hydrologist certified by the American Institute of Hydrology, 2499 Rice Street, Suite 135, St. Paul, Minnesota 55113.
   (4) A groundwater professional certified by the National Ground Water Association, Association of Groundwater Scientists and Engineers Division, 601 Dempsey Road, Westerville, Ohio 43081.
   (5) Another groundwater professional certified by an organization approved by the Department.

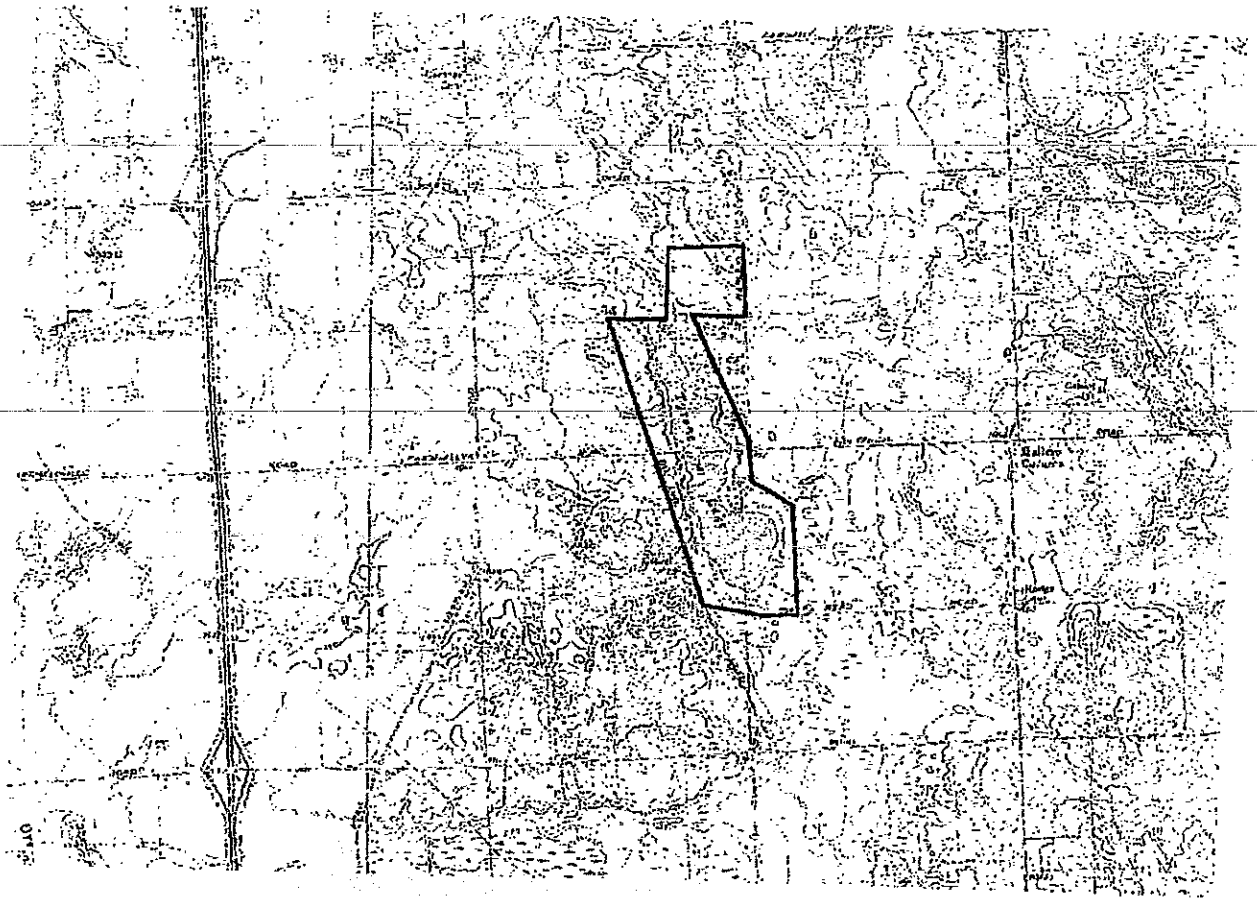
20. Right of Entry

The permittee shall allow the Department or any agent appointed by the Department, upon the presentation of credentials:

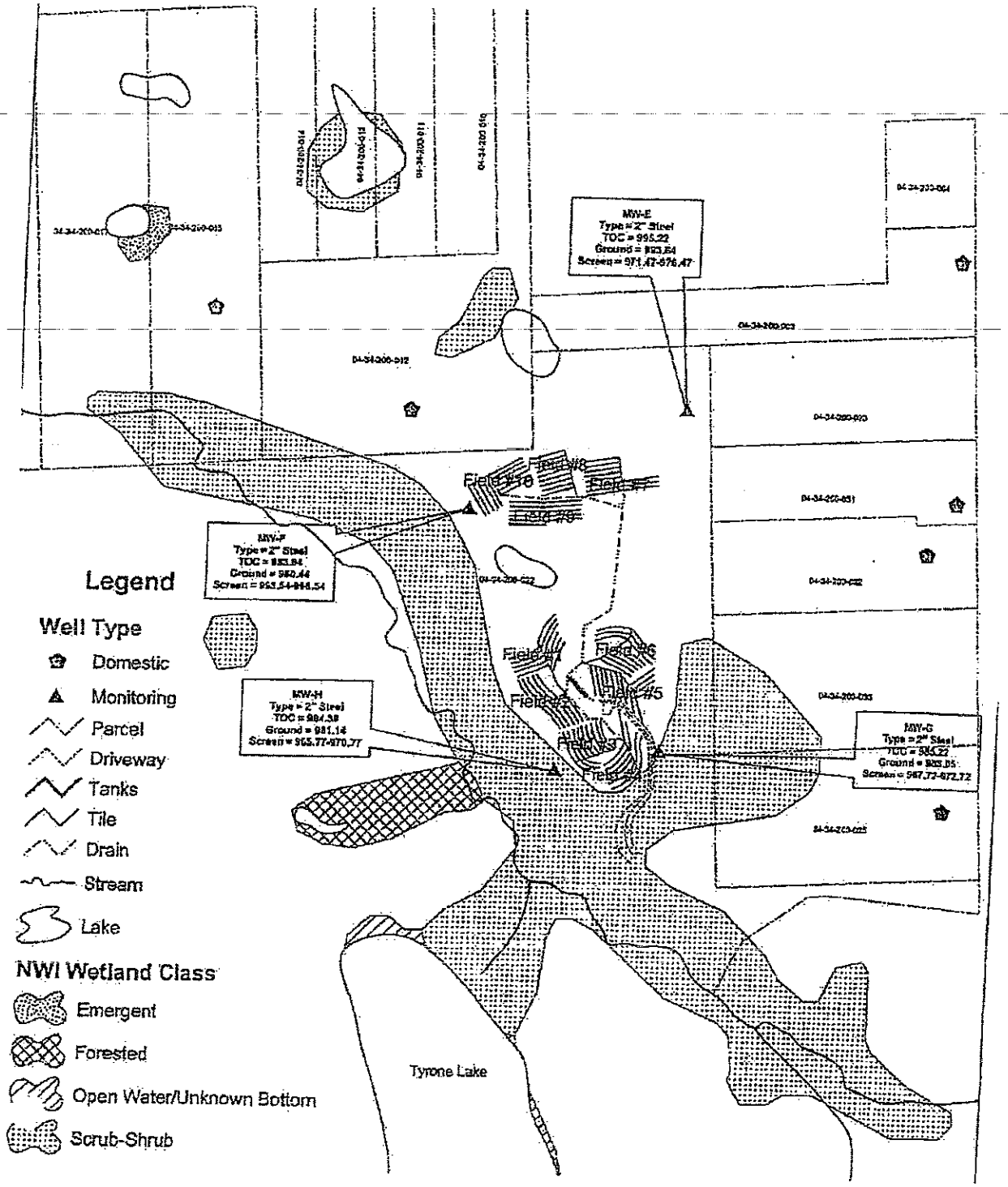
a) to enter upon the permittee's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this permit; and

b) at reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect process facilities, treatment works, monitoring methods and equipment regulated or required under this permit; and to sample any effluent discharge, discharge of pollutants, and groundwater monitoring wells and soils associated with the discharge.

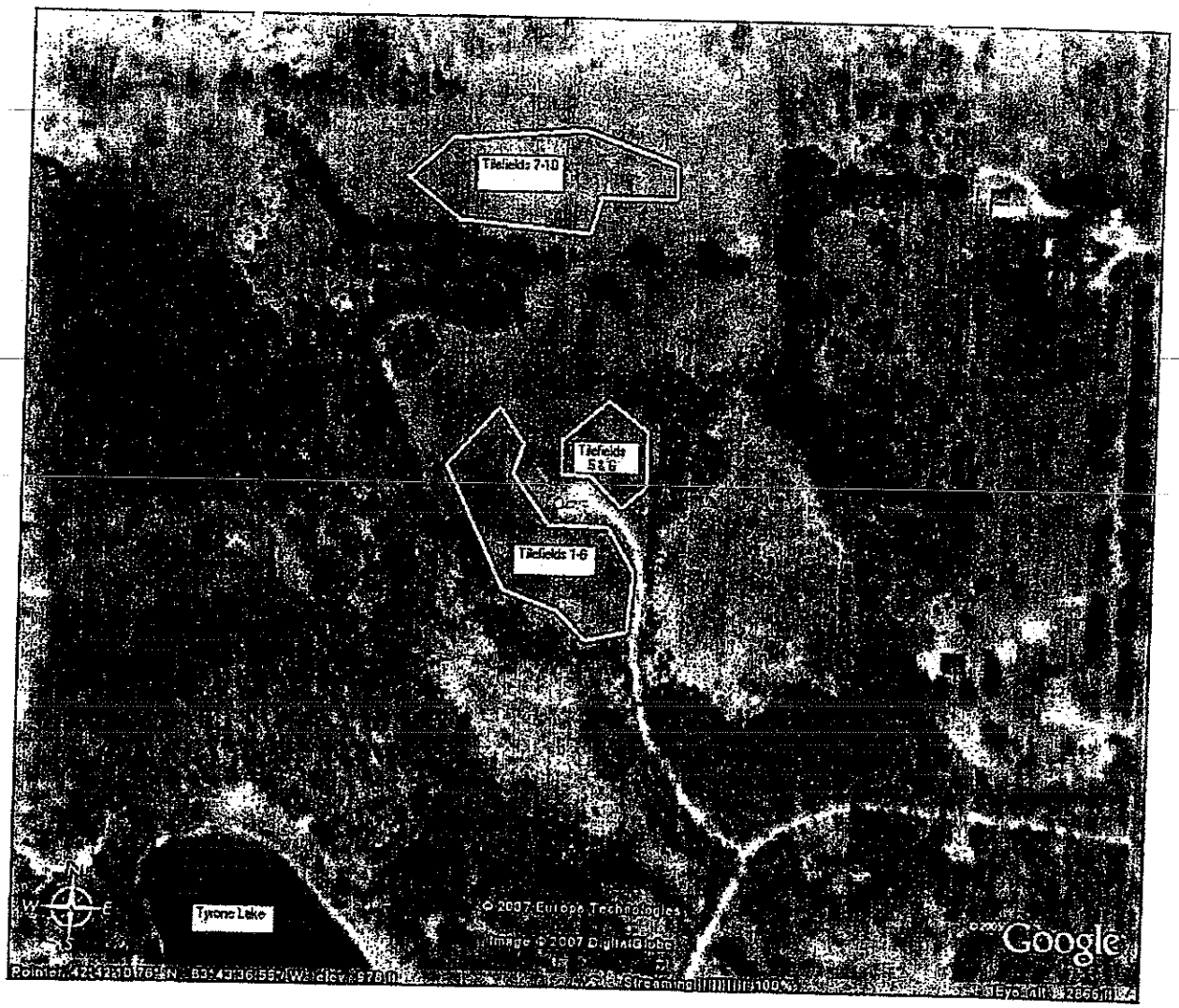
ATTACHMENT I



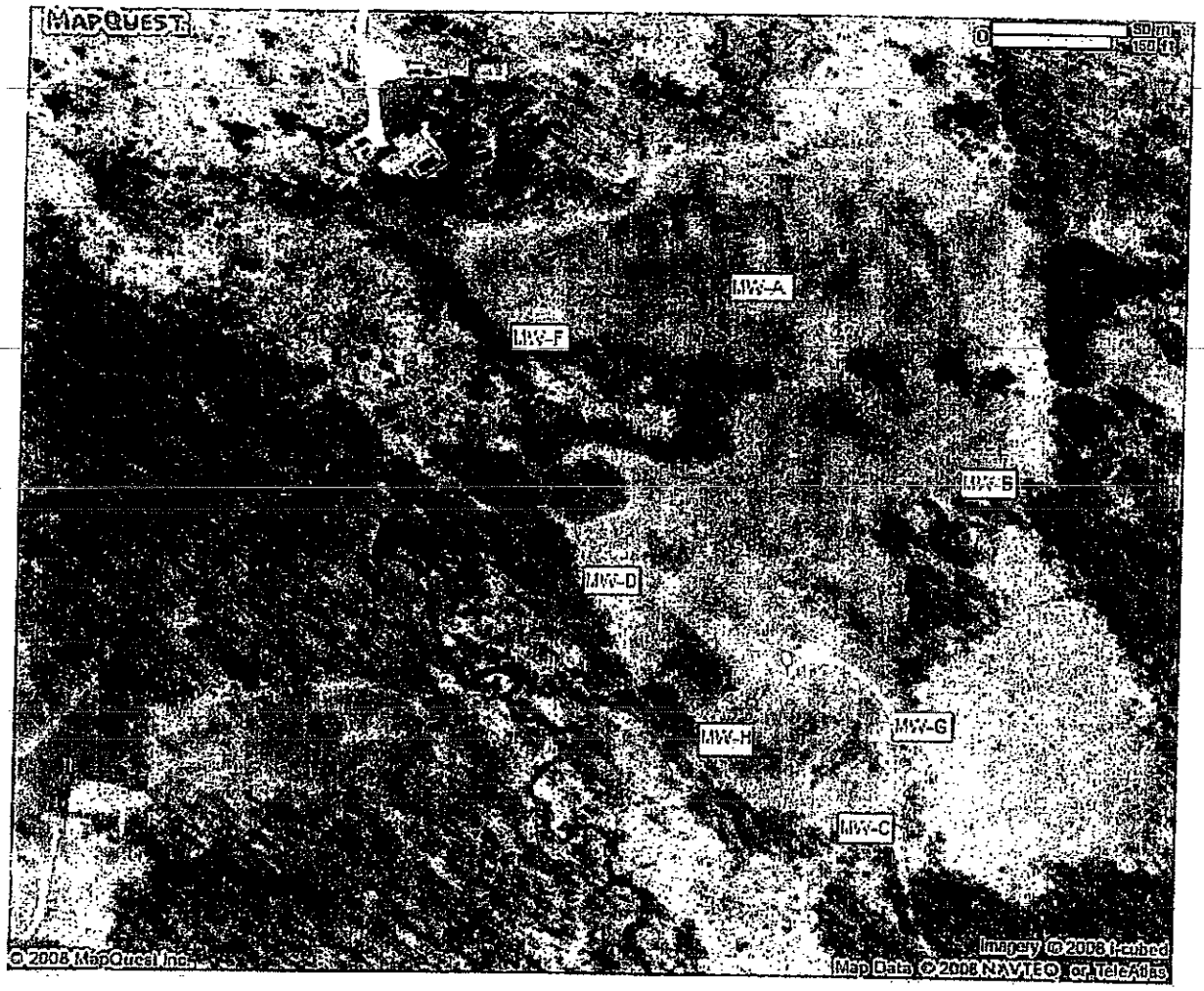
ATTACHMENT III



ATTACHMENT V



ATTACHMENT VI



Map showing old existing wells that will not be utilized

ATTACHMENT VII

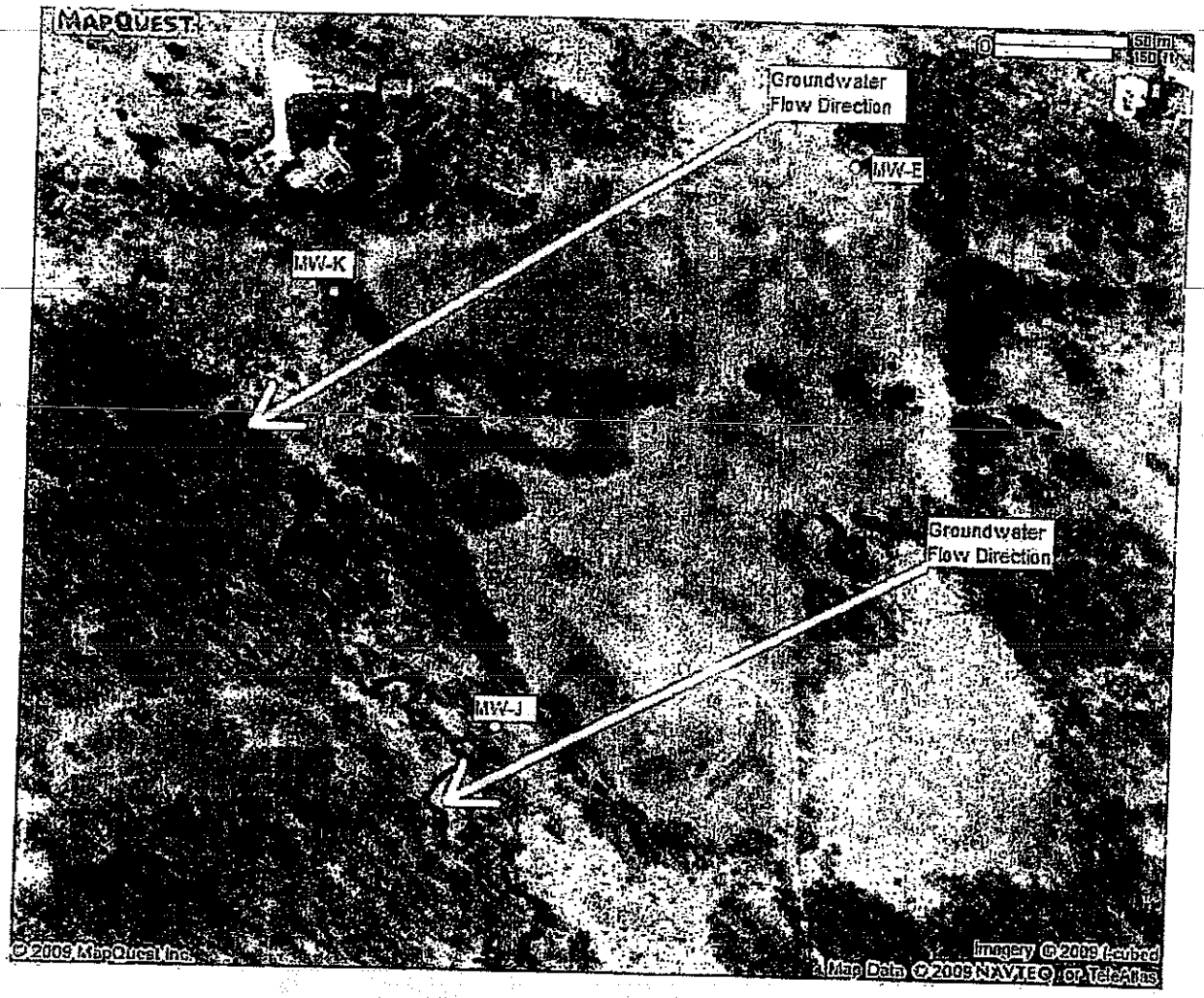
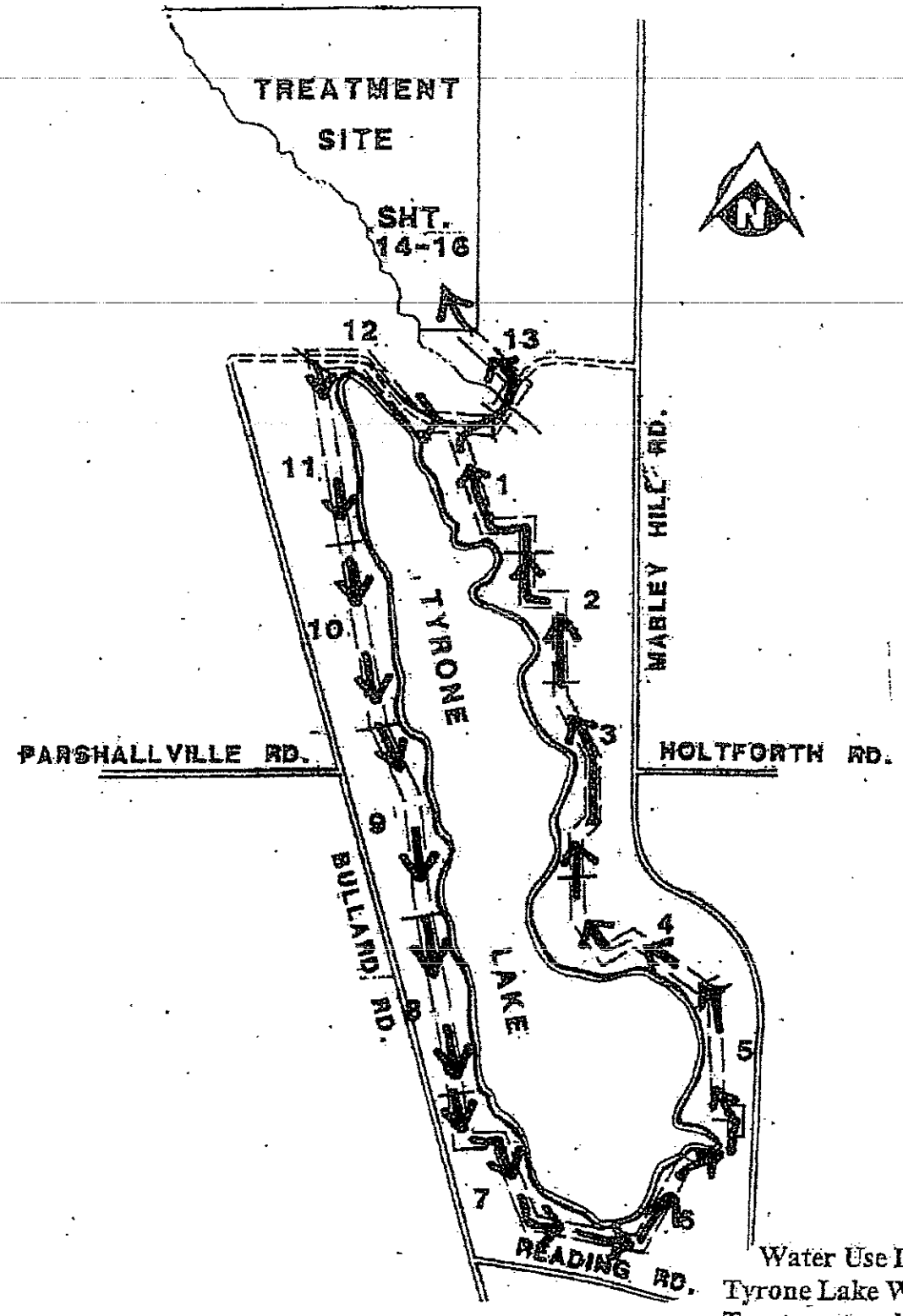


Figure 1

Showing existing upgradient monitoring well MW-E and newly installed downgradient monitoring wells MW-K and MW-J

ATTACHMENT VIII



Water Use Diagram
Tyrone Lake Wastewater
Treatment and Disposal
Tyrone Township
Livingston County, MI

NO SCALE

PUBLIC NOTICE

Date: January 15, 2009
Permit No. GW1810203
Livingston County Drain Commission
Tyrone Lake Drainage District

The Michigan Department of Environmental Quality proposes to reissue a discharge permit authorization for a wastewater discharge to the ground or groundwater pursuant to Rule 2218 of the Part 22 Rules of Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451) being Sections 324.3101 through 324.3119 of the Complied Laws of Michigan, and the administrative rules promulgated there under, to:

Livingston County Drain Commission
Tyrone Lake Drainage District
6335 Mabley Hill Road
Fenton, Michigan 48430

The applicant proposes to discharge a maximum 40,000 gallons per day (14,600,000 gallons per year) of sanitary sewage only to the ground and groundwater from their discharge areas located in the NE 1/4 of the SE 1/4 of Section 34, T4N, R6E, Tyrone Township, Livingston County.

Comments or objections to the proposed authorization received by February 13, 2009, will be considered in the final decision to grant the authorization. Persons desiring information regarding the proposed permit, or procedures for commenting or requesting a hearing should contact Permits Section, Water Bureau, Department of Environmental Quality, P.O. Box 30273, Lansing, Michigan 48909, Telephone: 517-373-8148.

Copies of the public notice and proposed authorization may be obtained via the internet (http://www.deq.state.mi.us/owis - click on 'Permits on Public Notice') or at the Water Bureau, Lansing District Office, located at Constitution Hall, 525 West Allegan, 4th Floor-North, P.O. Box 30242, Lansing, Michigan 48909, Telephone: 517-335-4598.

CERTIFICATION OF PUBLIC NOTICE

Facility Name: Livingston County Drain Commission

Rule 2117 requires that a draft groundwater discharge permit shall be circulated within the geographical area of the proposed or existing discharge. The rule specifies three ways in which a draft permit can be public noticed. On January 8, 2009, you were sent a draft permit and public notice; please indicate below the manner in which you public noticed your draft groundwater discharge permit:

X Posting of the notice in the post office or other public buildings of the municipality nearest the premises of the applicant in which the discharge is or will be located.

____ Posting of the notice at the entrance to the applicant's premises or nearby.

____ Publishing the notice in 1 or more newspapers of general circulation in the area of the applicant, or if appropriate, in an applicable periodical.

Please identify the locations where the attached draft groundwater discharge permit was public noticed, and the dates when the public notice began and ended:

Location: LIVINGSTON CO. EAST COMPLEX 2300 E. GRAND RIVER HOWELL 48843

Location: HARTLAND TOWNSHIP OFFICES 2655 CLARK RD. 48353

Location: TYRONE TOWNSHIP OFFICES 10408 CENTER RD. FENTON 48430

Date: 1/9/09 THROUGH 2/12/09

Signature: Robert N. Dengler

Title: DEPUTY DRAIN COMMISSIONER

Date: 2/12/2009

Please complete and return to:

WATER BUREAU
GROUNDWATER PERMITS UNIT
PO BOX 30273
LANSING, MICHIGAN 48909

APPENDIX D – COST ESTIMATE BREAK DOWNS

COLLECTION SYSTEM COST ESTIMATES