Project Plan

City of Charlevoix
Charlevoix County, Michigan

Wastewater Treatment Plant Improvements

April 2013

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EXECUTIVE SUMMARY

This Project Plan is prepared on behalf of the City of Charlevoix, Charlevoix County, Michigan, for the purpose of obtaining a Wastewater State Revolving Fund (SRF) loan from the Michigan Department of Environmental Quality for the construction of improvements to City of Charlevoix's Wastewater Treatment Plant. The applicant is the City of Charlevoix, and the proposed work is at the City's Wastewater Treatment Plant, which is located just outside the city limits in Charlevoix Township. Funding will be obtained through the City of Charlevoix; the City of Charlevoix and customer communities will be responsible for the debt retirement.

The existing Wastewater Treatment Plant is not able to meet the future requirements of the current phased facility discharge permit. The current NPDES permit number MI0057737 took effect on January 1, 2011, and it expires on October 1, 2014. However, in the case of ammonia nitrogen, more restrictive discharge limits are contained in the permit for an effective date beginning on October 1, 2014, and still more restrictive limits beginning on December 1, 2015. Also, the permit has a schedule of compliance which requires an evaluation of options by September 1, 2013, construction of corrective facilities by October 1, 2015, and attainment of discharge limits by December 1, 2015.

In addition to the NPDES permit issues, many components of the 40-year old plant have reached the end of their operational life. The plant is in need of significant improvements to meet current design and safety standards and to reduce the time and expense required for operation and maintenance. As a result, it is necessary that improvements be made that will enable the facility to provide the required level of service and meet all permits requirements and regulations. Following is a summary of the physical conditions that presently exist at the City of Charlevoix's Wastewater Treatment Plant:

1. The plant originally was constructed in 1972.
2. Mechanical equipment is at or near the end of its useful life and needs to be replaced.
3. Control systems are old and unreliable and need to be replaced.
4. Tanks and buildings are degrading and need to be rehabilitated or expanded.
5. Facilities for plant administrative functions (laboratory, office, record keeping, SCADA) are inadequate, cramped, and located in the existing Service Building.
5. The existing diesel generator is old and requires manual transfer.
6. Underground yard piping is original and portions need to be replaced.

The proposed project would include the following elements:

1. Basic plant upgrades are needed to meet current design and safety standards as well as to reduce the time and expense required for operation and maintenance. The basic plant upgrades are necessary regardless of the selected treatment alternative. Basic plant improvements are summarized as follows:

    a. Headworks – Addition of a redundant screen; repair or replacement of the grit collector; addition of a redundant meter at the effluent flume; addition of a bio-filter for odor control.

    b. Primary Settling – Repair of the second primary settling tank and replacement of mechanical equipment; process piping modifications to enable the plant to function as a single unit rather than two separate trains as it is currently configured; covering the primary settling tanks to maintain wastewater temperatures and facilitate odor control.

    c. Aeration – Depends on alternative selection and will be determined in preliminary design.

d. Final Settling – Repair of both final settling tanks and replacement of mechanical equipment. If Alternate 3 (MBR) is selected, final settling tanks would not be required and they could be removed from service.

e. Disinfection – Conversion from chlorine to ultra-violent disinfection.

f. Sludge Digesters – Repair of the sludge digesters and replacement of transfer pumps.

g. Sludge Thickening – Addition of a new process unit to provide thickening of the sludge prior to digestion.

h. Sludge Storage – Provision of a sludge storage tank with volume of 200,000 to 300,000 gallons.

i. Administrative Functions and SCADA – Construction of an administration building that would include space and facilities for record keeping, office functions, laboratory and Supervisory Control and Data Acquisition (SCADA), as well as a conference room, lunch room, restrooms and plant SCADA upgrades.

j. Odor Control – Construction of a bio-filter to control the odors from headworks, primary settling and biosolids treatment.

k. Site Lift Station Force Main – Reconfiguration of the on-site lift station and force main to redirect flows from the primary clarifiers to the headworks for preliminary treatment and solids removal.

l. Electrical and HVAC – Replacement of the emergency, standby diesel generator and general upgrades to electrical and HVAC systems to bring into compliance with current design, code and safety standards.

2. Alternate 3: Advanced Treatment, including additional aeration tanks, air and piping systems, and an advanced treatment technology such as fixed film aeration or membrane bioreactor. The system will perform satisfactorily under City of Charlevoix's relatively cool water conditions that prevail during the winter and allow the WWTP to meet the NPDES permit limits in accordance with the schedule of compliance.

The estimated probable cost for the Wastewater Treatment Plant Improvements project is $10,895,000. The City of Charlevoix is pursuing a SRF loan for the project in the approximate amount of $10,895,000. Assuming all $10,895,000 is financed with a SRF loan for the 20-year period at a 2.50% interest rate, the annual debt retirement and operation, maintenance and equipment expense for the proposed project is estimated to be $763,883. It is estimated that the sewer bill cost increase for a typical residential customer would be approximately $22.22 per month.

I. PROJECT BACKGROUND

A. Study Area Characteristics

1. Delineation of the Study Area

The study area is defined by the corporate boundaries of the City of Charlevoix, Charlevoix Township, Marion Township, and Hayes Township. The service area is comprised of the service area of the City of Charlevoix's Wastewater Treatment Plant, which is located at 15116 Lake Shore Drive, just west of the city limits. The footprint of the Wastewater Treatment Plant covers approximately three (3) acres of the northern portion of the ten (10) acre plant site. A site plan of the existing wastewater treatment facility is included in Appendix A.

The Wastewater Treatment Plant currently serves over 5,000 users in the City of Charlevoix, and in the Townships of Charlevoix, Marion, and Hayes (hereinafter referred to as the "Townships").

Figures 1 and 2 show the study area and the approximate municipal wastewater service area boundary, in addition to the existing wastewater collection system, pumping facilities, and treatment facility. The City of Charlevoix has service agreements with the Townships which are included in Appendix B. Figure 3 is an aerial photograph of the existing WWTP site.

The current rate structure includes sewer service charges based on water meter size and a commodity charge, with similar rates for "Rural" customers and "In-City" customers. A user charge system will be developed as part of this project plan.

2. Land Use in the Study Area

The existing land uses in the City of Charlevoix portion of the study area consist primarily of single family residential, with smaller areas of public reserve (airport, cemetery, golf course, school, etc), scenic reserve, marine, commercial and industrial.

The current land uses in the Charlevoix Township portion of the study area include residential, commercial and industrial, and agricultural areas, in addition to scenic reserve and mineral resource districts.

The land uses in the Marion Township portion of the study area consist primarily of agricultural, with small areas of residential and commercial.

The land uses in the Hayes Township portion of the study area consist primarily of agricultural, with small areas of residential and commercial.

The proposed project will occur only on the site of the existing Wastewater Treatment Plant and all land use regulations and policies will be followed. No sensitive features, such as wetlands, will be impacted.

Current zoning maps for the City and adjacent townships are included in Appendix C.

Future land uses in the study area over the 20-year planning period are similar to those in the current zoning maps and will not be affected or impacted by the proposed project. Upgrades and improvements to the Wastewater Treatment Plant will allow the City to continue to provide a high level of sewer service to its customers in addition to allowing for future service areas.

3. Surface and Ground Waters

The City of Charlevoix is located adjacent to Lake Michigan, from which the City obtains its drinking water. A Year 2004 source water assessment determined that the City's source water (Lake Michigan) had a moderate sensitivity rating along with a moderate susceptibility to contamination. The City's drinking water meets all State and Federal requirements.

The City's Wastewater Treatment Plant is located south of Lake Shore Drive, more than two hundred (200) feet from the shoreline of Lake Michigan. The proposed project at the plant site will not adversely impact Lake Michigan surface waters but will enable the plant to produce higher quality effluent meeting NPDES permit limits.

The eastern city limit is defined by the shoreline of Lake Charlevoix. Lake Charlevoix stretches from the City of Charlevoix approximately 13 miles southeast to Boyne City and approximately 12.5 miles south-southeast to the City of East Jordan.

The City also encompasses Round Lake, which is an approximately 50-acre body of water located on the waterway between Lake Michigan and Lake Charlevoix.

Groundwater is not used for public water supply or for agricultural or industrial use in the area of the treatment plant. Therefore, the groundwater will not be impacted in any way.

B. Economic Characteristics

Due to the immense amount of water in close proximity and the pleasant summer weather, Charlevoix is a popular summer retreat. Charlevoix's main industry is tourism but also includes manufacturing.

According to the 1997 Economic Census, the largest employee classification within the City of Charlevoix is manufacturing (48%), followed by accommodation and food services (18%) and retail trade (17%). According to the 2000 Census information for Charlevoix County, the total labor force increased by nearly 27-percent from 1990 to 2000 and the unemployment rate decreased from 8.6-percent to 5.1-percent unemployed (41% reduction). The Charlevoix Area Chamber of Commerce lists the 2006 Unemployment Rate at 7.4% and the top five employers in the county as East Jordan Iron Works, Boyne USA Inc., LexaMar Corporation, Harbor Industries, and Grandvue Medical Care Facility. The median housing value in 2000 was listed as $112,700.

The 2010 Census indicates a median household income of $48,704 and 11.3-percent of the population below the poverty level for Charlevoix County (2006-2010). The per capita income for Charlevoix County residents was $28,403 with an average of 2.26 persons per household (2006-2010).

The population of the City of Charlevoix was 3,519 in 1970, 3,296 in 1980 (-6.34%), 3,116 in 1990 (-5.46%), 2,994 in 2000 (-3.92%), and 2,513 in 2010 (-16.1%). In the same 10-year increments from 1970 to 2010, the population of Charlevoix Township changed by 37.9%, 2.3%, 67% and -3.1%; the population of Marion Township changed by 36.3%, 19.5%, 32% and 14.9%; and the population of Hayes Township changed by 80.5%, 3.4%, 43.7% and 1.4%. Charlevoix County experienced overall growth from 1970 to 2010, with growth rates of 20.4%, 7.8%, 21.5%, and -0.5% in the 10-year increments. Total population data and service area population data are provided in Table 1 and Table 2, respectively.

The gradual migration of population away from the City and the population increases in the neighboring townships has resulted in relatively consistent sewage flows to the City's

Wastewater Treatment Plant in recent years. These gradual trends are expected to neither increase nor decrease the need for wastewater treatment capacity; however, the proposed project is needed to provide reliable treatment of wastewater for the next twenty years and beyond.

C. Existing Facilities

1. Method of Wastewater Treatment

All wastewater from the sewer service areas in the City of Charlevoix and the Townships is transported to the Charlevoix Wastewater Treatment Plant (hereinafter referred to as "WWTP"), which is located on Lake Shore Drive just west of the city limits in Charlevoix Township.

The Charlevoix Wastewater Treatment Plant was constructed in 1972. At the time, it was a state of the art plant using the activated sludge process to provide secondary treatment. The plant units include: some preliminary treatment units collectively known as headworks; primary settling tanks for removal of suspended solids; aeration followed by final settling, collectively known as activated sludge, followed by chlorine disinfection. The solids which are removed by the primary and secondary settling tanks are treated in sludge digesters and disposed by land application. Figure 4 is a schematic diagram of the existing plant processes. Each process is described in further detail below, and the treatment plant capacities are summarized in Table 3. Also included is a discussion on process unit performance compared with modern design criteria expressed in the "Recommended Standards for Wastewater Facilities," 2004 edition.

a. Screen

The screen is an automatic, mechanical 3/8" screen with a 2" manual bar screen as backup or bypass. This screen size is smaller than a coarse screen but larger than a fine screen as described by Ten States Standards. While the screen is old, the screen condition is satisfactory. An upgrade to duplicate units with maximum ¼" opening will be considered for any plant process upgrade.

b. Flow Meter

The plant flow meter is a 12" parshall flume with a capacity of 4.0 mgd. This capacity is more than adequate and meets Ten States Standards except that the plant does not have a redundant unit. The parshall flume is in satisfactory operating condition. A redundant effluent meter will be considered for any plant process upgrade.

c. Grit Collector

The existing grit collector is a single, vortex grit collector with a collection sump and grit pump to remove the grit. During the time the grit collection may be out of service, grit is carried into the primary settling basins and then to the digesters. The present grit collector is operating well.

d. Primary Settling

The plant has two primary settling tanks of forty-five feet diameter and an area of 1,590 square feet each. The settling basins have a side water depth of eight feet. Using both settling tanks, the overflow rate is 157 gpd/sf on the average day and 314 gpd/sf on the maximum day. Both the side water depth and overflow rate are below the recommended Ten States maximum.

The primary settling tank mechanisms are forty years old. One tank has been drained and the mechanism cleaned, repaired and repainted. A similar process should be performed on the second tank.

At present, the primary effluent is divided between two aeration tanks and their respective final settling tanks. Minor piping and control changes should be made to combine the aeration tank effluents as well as the final tank effluent return sludge lines.

e. Aeration

The plant employs the activated sludge process using complete mix aeration. There are two tanks, each with capacity of 15,600 cubic feet for a total of 31,200 cubic feet. The aeration tanks use coarse bubble aeration.

Primary effluent averages 495 lbs/day of BOD with a maximum of 1,240 lbs/day of BOD. Digester supernatant has a design average of 40 lbs/day of BOD with a maximum of 70 lbs/day of BOD which is returned to the primary settling tanks and is included in the primary effluent.

The influent biochemical oxygen demand (BOD) concentration appeared high in 2009 but has decreased since that time. The City is not aware of any changes in the system since 2009 that may have affected the influent BOD. The City has indicated that the 2009 data may be suspect. Influent BOD levels dropped in 2010 and 2011 but increased slightly again in 2012, as shown on the Influent BOD chart in Appendix D.

The MDEQ has proposed strict limitations on ammonia which will require the WWTP to use the nitrification process whereby ammonia is converted to nitrate.

A nearly tripling of aeration tank volume may be necessary to meet Ten States Standards and MDEQ requirements. In addition, the aeration diffusers should be replaced with fine bubble aeration to improve their efficiency.

In addition, consideration will be given to denitrification which is the conversion of nitrate to nitrogen gas. This process would improve plant efficiency, reduce the need for chemical pH adjustment and produce a better effluent.

As a result, an increase in blower capacity will be required to accommodate the increase in aeration tank volume, the change to fine bubble aeration, the possible increase in depth of the new tanks and the change to ammonia removal.

In 2012, operational changes were made to the treatment process to improve the effluent ammonia quality. Such changes, however, still were not adequate to enable the WWTP to meet the revised discharge limits. In addition, nitrification of ammonia can occur effectively only when water temperatures are above 50°F. In the first four months of 2009, 2010, and 2011, the average wastewater temperature was 49°F. However, the average flow temperature over the same time period in 2012 was 52°F, yielding more effective ammonia removal. In the winter months of 2013, the average wastewater temperature already dropped below 50°F and nitrification for ammonia removal was not possible.

At present, the City has to operate the full plant – with no redundancy and no opportunity to perform maintenance without full plant shutdown – in order to maximize ammonia removal. This optimized operation, however, still is not adequate to meet the discharge permit limits.

f. Final Settling

Final settling is provided by two tanks of thirty-five feet diameter. The surface area is 962 square feet in each tank for a total of 1,924 square feet; this is adequate to meet the average flow of 1.0 mgd at the maximum overflow rate of 1,000 gpd/sf per Ten States Standards. The side water depth is 10.5 feet, which is less than the Ten States required minimum.

The condition of the mechanisms below the water level is unknown. The secondary settling tanks should be dewatered, inspected, repaired and repainted as necessary.

The final clarifiers are performing satisfactorily by meeting the requirements of the NPDES permit.

g. Disinfection

Disinfection for the plant is provided by chlorine which is fed to the chlorine contact tanks. Two chlorine contact tanks operate in parallel, each with a volume of 2,522 cubic feet. Detention time is 53 minutes at the peak hour using both tanks. The condition of the tanks appears to be adequate.

Because of the hazard in storing and handling chlorine and because it is necessary to de-chlorinate before discharging the final effluent, consideration should be given to replacing chlorine as the disinfectant with ultra-violet light. This change would improve safety conditions and would eliminate the need to use de-chlorination chemicals.

h. Sludge Digesters

Waste activated sludge is pumped to the primary clarifiers. Sludge from the primary clarifiers is pumped to the primary sludge digesters. A sludge thickening process should be considered along with any improvements to the plant. The solids concentration in the primary sludge is approximately 2-percent. Increasing the solids concentration to 4-percent would reduce by one-half the volume of sludge needing further treatment. The primary digester is thirty-five feet in diameter with twenty-three feet side water depth. The volume is approximately 165,000 gallons. The secondary digester is thirty-five feet in diameter with twenty feet side water depth. The volume is approximately 145,000 gallons.

The existing sludge digesters meet Ten States criteria satisfactorily and are sized adequately for loading for moderately mixed systems.

The digesters currently are full of sludge and have not been drained recently. They should be drained, inspected, repaired and placed back in service.

2. Method of Sludge Handling

The City of Charlevoix Wastewater Treatment Plant produces grit, screenings, and sludge residuals from the treatment process as described in the previous section. The treatment plant originally was designed to utilize sludge drying beds. Currently, all residuals are transported and disposed of at a licensed landfill.

3. Wastewater Collection Facilities

The majority of the wastewater collection system servicing the City of Charlevoix was constructed starting in the 1970's. The wastewater collection system serving the Townships primarily was constructed between the early 1980's and the early 2000's.

The wastewater collection system within the City sewer service area consists of approximately 20 miles of 6-inch, 8-inch and 12-inch gravity sewers. The collection system serving the Townships consists of approximately 15 miles of 6-inch, 8-inch and 12-inch gravity sewers. The sewers collect the sewage flow and the lift stations lift the flow from lower areas so that the flow arrives at the Wastewater Treatment Plant. The sewers and lift stations are shown in Figures 1 and 2.

The oldest sewers in the collection system generally are of clay pipe construction and there are some areas with concrete sewers. Over the past ten (10) years, the City of Charlevoix has televised the entire wastewater collection system and there are no indications of major deficiencies or imminent failure.

In the past 2-3 years, there have been no mainline blockages causing sewer backups. Before three years ago, there were a few problem areas of root intrusion and grease buildup causing sewer backups. However, these problem areas have been replaced with new PVC pipe and the backups have not re-occurred. In addition, the City proactively jets and cleans the collection system to minimize the potential for sewer backups. Finally, the City routinely televises the areas where they think problems may develop and the required cleaning and/or repairs are performed.

Based on knowledge gained from televising the sewer system, the City has identified the sewers that are in the poorest condition and has developed an infrastructure capital improvement plan. The City currently is about three (3) years into a 10-year capital improvement plan in which $600,000 to $1,000,000 is expended annually for infrastructure upgrades, including road and water system work in addition to sanitary

sewer activity. The City plans to revise and update the plan as new information becomes available.

4. Facility Locations

The City of Charlevoix Wastewater Treatment Plant is located at 15116 Lake Shore Drive in Charlevoix Township. Lift stations and the collection system components are identified in Figures 1 and 2.

5. System Flow Rates

The current capacity of the City of Charlevoix Wastewater Treatment Plant is 2.00 mgd. The existing characteristics of the wastewater are provided in the figures attached as Appendix D.

Review of historical data (2009-2011) indicates the influent average day flow rate is approximately 0.37 million gallons per day (mgd) or 254 gallons per minute (gpm). The maximum month (July) average day flow rate is 0.53 mgd or 366 gpm. The maximum day flow rate is 0.89 mgd (618 gpm); this equates to maximum day peaking factor of 2.43. The maximum hour flow rate is 1.00 mgd (700 gpm), which yields a maximum hour to average day peaking factor of 2.76.

Wastewater flows were projected through the year 2032 (20-year projection) based on historical flow rates, trends, and anticipated expansion of the service area into the adjacent townships. A general increase in the existing average day flows of about 15-percent over each 5-year increment is consistent with the population growth projections and some flow increases for new service areas. The anticipated Year 2032 average daily flow is 0.602 mgd during most of the year. The maximum month (July or

August) average day flow for Year 2032 is projected to be 0.79 mgd. Average day flow projections are shown in Figure 5 and Table 4.

A general increase in the existing maximum day flows of about 8-percent over each 5-year increment is projected through Year 2032. The anticipated Year 2032 maximum daily flow is 0.954 mgd with a peak flow of 2.0 mgd. Maximum day flow projections are provided in Figure 5 and Table 5.

The current configuration and capacity of the existing treatment plant can accommodate these projected average daily flows and maximum daily flows. Therefore, the proposed improvements do not include an increase in the nominal treatment capacity of the WWTP. However, the revised effluent limits in the new facility discharge permit require significant unit process modifications. As a result, the proposed improvements are necessary to comply with the new facility discharge permit limits for ammonia nitrogen and to bring the WWTP up to current design and safety standards.

6. Major Industrial Discharges

There are no major industrial discharges to the WWTP from the City or Townships.

7. Infiltration/Inflow

An in-depth infiltration-inflow (I/I) study was not performed for the Wastewater Treatment Plant sewer service area. However, a non-precipitation/high groundwater and wet weather/precipitation analysis was completed for an initial quantification of the collection system I/I.

First, wastewater flows were analyzed during conditions of high groundwater (March/April/May and September/October/November from 2009-2011) to determine

the per capita flow rate relative to the criteria for excessive infiltration (120 gpcd). Six days in the months listed were selected based on the maximum daily wastewater flow after several days of no precipitation. Results indicate a per capita base rate ranging from about sixty (60) gpcd to about eighty (80) gpcd, which is below the criteria for excessive infiltration. Data are provided in Table 6.

Second, flows were analyzed between April and October in the period from 2009 to 2011 for comparison to the criteria for excessive inflow (275 gpcd). Six days in the months listed were selected based on the maximum daily wastewater flow during or just after the largest precipitation events. Results indicate a per capita flow rate ranging from about seventy (70) gpcd to 100 gpcd, which is well below the criteria for excessive inflow. Data are summarized in Table 6.

Finally, there were several occasions during the summer months (July 2009, July 2010 and July 2011) when wastewater flows exceeded the highest "dry weather maximum day flow" and the highest "wet weather maximum day flow" listed under the Non-Precipitation Days and Wet Weather Events in Table 6. These higher wastewater flows did not result from infiltration due to high groundwater or from inflow due to a wet weather event. Rather, the flows occurred during the heavy tourism – and thus significantly enlarged service population – months in the City of Charlevoix. As described in the Population Data section below, the City estimates their population increases to three or four times the typical population during the summer months. Assuming a conservative 50-percent increase in service population (from about 5,270 persons to about 7,900 persons), the July 2009 maximum day flow of 0.72 mgd yields a per capita flow rate of 91 gpcd. Table 6 again indicates this does not surpass the threshold for excessive I/I.

There are no known instances of precipitation events causing wastewater backup problems, overflows or poor treatment performance due to hydraulic overloading.

8. Combined Sewers

Any partially combined or combined sewer systems in the City have been separated. At this time, no combined sewers exist within the City of Charlevoix Wastewater Collection System.

9. Sewer Overflows

As stated above, no combined sewers exist within the City of Charlevoix Wastewater Collection System; therefore, no combined sewer overflows (CSOs) occur. The sanitary sewer lift stations within the sewer service area do not have sanitary sewer overflows. Backups into basements of businesses or residential homes likely are to occur prior to any overflows.

10. Lift Station Capacities

The locations of the major lift stations are shown in Figure 2, and descriptions of the major lift stations are provided in this section. The City operates and maintains seventeen (17) sanitary sewer lift stations and makes improvements to the stations as needed. The stations range in size from a 2hp duplex station to a 45hp triplex submersible station. Currently, all the lift stations can meet peak flow demands using firm pump capacity. Several smaller lift stations, which are not described herein, convey flows from local neighborhood areas to either the major lift stations or the WWTP.

The Bridge Park Lift Station (Main L.S.) is located adjacent to Round Lake; it is the primary lift station that conveys wastewater flows from the City's North Side Service

Area (north of Round Lake and Lake Charlevoix) to the Wastewater Treatment Plant. The City's original wastewater treatment facility was located on the current Bridge Park L.S. site. When the Lakeshore Wastewater Treatment Plant was constructed in 1972, the Bridge Park treatment plant was converted to a lift station with grit removal and screening. In 1997, a grit screening facility was constructed at the Lakeshore Drive Wastewater Treatment Plant, and a new lift station with no treatment operations was constructed at Bridge Park. The firm capacity of the Bridge Park Lift Station is 4.0 mgd. All the pumps have been replaced within the last six (6) years, and the City has a new backup pump on hand. The City's assessment of the Bridge Park (Main) Lift Station found it to be in good condition.

The Business Park Lift Station serves the northeast area of the city, has a firm capacity of 0.21 mgd (146 gpm) and is providing reliable service. The Depot Beach Lift Station, located adjacent to Lake Charlevoix just northeast of Round Lake, serves the Coast Guard Lift Station (pumps updated in 2008) and the C&O Club Development. The Depot Beach L.S. has a firm capacity of 0.1 mgd (70 gpm) and is providing reliable service with pumps that were updated in 2008. Both the Business Park L.S. and the Depot Beach L.S. transfer flows to the Bridge Park L.S. before it is conveyed to the WWTP.

The Airport Lift Station is located adjacent to the Charlevoix Municipal Airport in the southwest portion of the City. The Airport L.S. serves portions of Charlevoix Township and Marion Township south of the city with a firm capacity of 1.15 mgd (800 gpm).

11. Lift Station Adequacy

A detailed review of the adequacy of the lift stations (i.e. backup power, alarms, controls, wet well/dry well separation, etc.) was not undertaken for this report. However, the City indicated there are no major deficiencies with any of the lift stations. Following is additional information regarding controls, alarms, and emergency power and bypass capability.

Controls for the lift stations include PLC/double transducer with float backup, PLC/transducer control with float backup, and float control. There are no known issues with lift station controls at this time.

Alarms for the stations include a Sensaphone Express II autodialer at the Bridge Park Lift Station, a Sensaphone SCADA 3000 at the Airport Drive Lift Station, and Guard It autodialers at all remaining stations.

The M66/Kmart and Airport Drive Lift Stations have onsite standby natural gas generators with automatic switchgear. The Bridge Park Lift Station has an on-site diesel generator with automatic switchgear. In addition to the permanent standby generators, the City has the following equipment used for backup power for the remaining stations:

- 40kW trailer-mounted standby generator.
- 9000W portable generator.
- 7500W portable generator.

Not all the lift stations have a bypass connection enabling pump-around capability in the event of a station failure. The Bridge Park Lift Station does have a bypass function which allows manual override of the pump if a drive or PLC were to go offline.

In lieu of a bypass pump connection for every lift station, the City owns and operates a vactor truck that can be used to pump and haul either to a nearby manhole or to the WWTP.

The City's assessment of the seventeen (17) lift stations yielded the following results: fourteen (14) stations in "good" condition and three (3) stations in "excellent" condition.

In summary, the City's lift stations are maintained in good to excellent condition and there are no known major issues or deficiencies that need to be addressed.

A detailed analysis of the capacity and adequacy of the lift stations should be conducted if the City of Charlevoix plans to expand its service area further into the adjacent townships.

12. Operation and Maintenance

Proper operation and maintenance of collection systems and conveyance facilities will increase equipment longevity and system efficiency. Another benefit of regular maintenance is that problems can be detected early and remedied prior to incurring larger expenses. Other benefits will be energy conservation and proper capacity of the sewer lines and pumps. Proper operation and maintenance will result in a highly reliable system and cost savings in energy consumption and replacement parts. A reliable system helps minimize the potential for sanitary sewer overflows.

The maintenance currently performed on gravity sewers is televising and periodic jetting of the lines. Televising is used to monitor the internal condition over time to determine if corrosion is occurring in pipes and/or manholes, to determine if solids are accumulating on the bottom of pipes, and to observe if infiltration is occurring. The

maintenance performed on and upgrades to the lift stations are sufficient to provide reliable, efficient stations. Currently there are no outstanding operation or maintenance problems with the collection system or lift stations.

D. Need for the Project

1. Compliance Status

The City of Charlevoix Wastewater Treatment Plant was constructed and placed in service in or around 1972. The plant uses the activated sludge process to treat wastewater from the City and the Townships. The existing Wastewater Treatment Plant presently is performing adequately within the limits of the current NPDES Permit Number MI0057737, which took effect on January 1, 2011, and expires on October 1, 2014. However, the permit demands much more restrictive ammonia limits by October 2014 and still more restrictive limits by December, 2015. The current treatment facility *cannot* meet the more restrictive ammonia limits of the current permit, and significant process improvements are needed as a result. In addition, the permit has a schedule of compliance with the following deadlines:

- September 1, 2013 – Submit data analysis and a description and evaluation of options considered in correcting the ammonia toxicity problem, including a detailed description of the selected alternative(s) and a schedule for acquisition and implementation of selected alternative(s).
- October 1, 2015 – Complete construction of corrective facilities or implementation of other approved remedies.
- December 1, 2015 – Attain and maintain an operational level necessary to meet the ammonia nitrogen discharge limits.

A copy of the discharge permit is included in Appendix E.

As described in the Existing Facilities – Aeration section above, the MDEQ has proposed strict limitations on ammonia which will require the WWTP to use the nitrification process whereby ammonia is converted to nitrate.

A significant increase in aeration tank volume may be necessary to meet Ten States Standards and MDEQ requirements. In addition, consideration must be given to denitrification which is the conversion of nitrate to nitrogen gas. This process would improve plant efficiency, reduce the need for chemical pH adjustment and produce a better effluent.

2. Standards Compliance and Reliability

The existing WWTP is forty years old and has many components that do not meet current reliability, safety and design standards. Also, some improvements are cost effective to reduce the time and expense required for operation and maintenance.

a. Headworks – The existing screen does not have a back-up unit which eliminates the WWTP's ability to screen the wastewater in the event of maintenance or failure of the existing screen. A redundant screen is needed to provide reliability and continuous operation.

   The existing grit collector also is a single unit while Ten States Standards requires multiple units or a single, mechanically-cleaned chamber with a bypass. Upgrade or replacement of the grit classifier is needed to meet the 20-year needs of the WWTP.

The flow meter has adequate capacity but does not meet Ten States Standards Requirements in that it does not have a redundant unit. Addition of a redundant effluent meter is needed to comply with current standards.

The addition of a bio-filter is recommended to control odors that originate in the headworks and to maintain the high level of service required of the WWTP.

b. Primary Settling – The primary settling basins do not meet the Ten States recommended side water depth, which results in less capture of suspended solids. The settling tank mechanisms are original and in need of cleaning, repair and repainting. The settling tank mechanical equipment is at the end of its useful life and should be replaced.

The existing WWTP is configured to perform as two separate trains. Process piping modifications are needed to enable the plant to function as a single unit and optimize the treatment process.

Covering the primary settling tanks is needed to maintain warmer wastewater temperatures that would optimize ammonia removal; covers also would facilitate odor control.

c. Aeration – The existing aeration tanks do not meet current design standards for BOD loading, nitrification, and total tank volume. When the WWTP was built, nitrification was not required. However, MDEQ now advises that nitrification will be required, which results in needing four times the present tank capacity.

In addition, the existing coarse bubble aeration diffusers are inefficient and should be replaced with fine bubble aeration to optimize oxygen transfer.

Finally, significantly increased blower capacity is needed to accommodate the increase in aeration tank volume, the change to fine bubble aeration, the possible increase in depth of the new tanks and the change to ammonia removal.

Specific aeration improvements are dependent on the alternative selected to address the discharge permit compliance requirements.

d. Final Settling – The existing final settling tanks do not meet Ten States Standards for minimum side water depth, which will result in less efficient settling of secondary sludge. The tanks and mechanisms need to be repaired and repainted. Mechanical equipment is original construction, has reached the end of its useful life and should be replaced. Depending on the selected alternative, the final settling tanks potentially could be removed from service.

e. Disinfection – Disinfection for the plant currently is provided by chlorine which is fed to the two chlorine contact tanks. The existing tanks provide a detention time that meets Ten States Standards. However, chlorine is a hazardous material that is dangerous to transport, store and handle. In addition, it is necessary to dechlorinate the final effluent before discharging it into Lake Michigan. Converting to ultra-violet (UV) disinfection would improve safety conditions and reduce the labor and expense associated with chlorination and dechlorination.

f. Sludge Digesters – The two existing sludge digesters meet Ten States criteria satisfactorily, but the tanks and transfer pumps are original construction. The tanks need repairs and re-coating and the pumps need to be replaced to extend their useful life beyond the 20-year planning period.

g. Sludge Thickening – Addition of a new process unit to provide thickening of the sludge prior to digestion would reduce the sludge volume in the digestion process and the supernatant volume that needs to be returned and treated, thereby improving plant efficiency.

h. Sludge Storage – Currently, all residuals are transported and disposed of at a licensed landfill as necessary. Construction of a storage tank would enable operators to choose the timing of sludge disposal to farm land.

i. Administrative Functions and SCADA – The current WWTP administrative functions (record keeping, office, laboratory, and SCADA facilities) are accommodated in cramped quarters in a remodeled area of the Service Building. Construction of a building separate from the service building is needed to enable efficient operation of and laboratory testing for the WWTP. Such an administration building would include space and facilities for record keeping, office functions, laboratory and Supervisory Control and Data Acquisition (SCADA), as well as a conference room, lunch room, restrooms and plant SCADA upgrades.

j. Odor Control – Odors associated with the treatment processes can be very obnoxious. Construction of a bio-filter to control the odors from headworks, primary settling and biosolids treatment is recommended to maintain a high level of service.

k. Site Lift Station Force Main – The onsite lift station receives various flows from within the WWTP. The force main currently discharges to the primary clarifiers. It is proposed to reconfigure the on-site lift station and force main to redirect flows to the headworks for preliminary treatment, solids removal and process optimization.

l. Electrical and HVAC – Following is a list of some of the electrical and mechanical deficiencies in the WWTP, observed on July 13, 2012, by Century A&E:

- The standby generator transfer switch is manually controlled, and the branch circuit protection associated with the transfer switch, generator and standby power feed is undersized.

- There is inadequate electrical working space (per the National Electrical Code) in several areas of the main electrical room.

- The existing main motor control center is original equipment and replacement/repair components are becoming less available and more costly. The electrical equipment is showing signs of rust deterioration and bus damage. The motor control center should be replaced and possibly relocated.

- In the headworks building, most legends and equipment identification plans on control stations and safety disconnect switches have deteriorated to the point of being illegible. In addition, flexible electrical conduit in a few locations should be replaced with explosion-proof flexible conduit.

- The emergency, standby generator fuel tank is not double-lined; it does not have interstitial space leak sensing, proper venting and emergency venting, or proper fill port containment or fill alarm. The existing generator and enclosure are well past their useful life expectancy and are in overall poor condition. Replacing the existing generator would be of high importance to provide the plant with a dependable standby power source during a prolonged utility power outage.

- All electrical associated with the primary clarifiers should be replaced due to lack of conduit seals, rust deterioration and overall poor condition.
- All electrical associated with the final clarifiers should be replaced due to rust deterioration and overall poor condition.
- HVAC equipment (unit heaters, air handling units, exhaust fans, switches, etc) are old or inadequately sized and/or controlled for the space.

3. Orders of Enforcement Action

Currently, there are no formal orders of enforcement in place for the Wastewater Treatment Plant. However, the new NPDES permit with its restrictive ammonia limits and schedule of compliance is, in effect, an order of enforcement requiring significant planning and fiscal undertaking by the City and adjacent townships.

4. Water Quality Problems

The water quality problems associated with the WWTP are described in the "Compliance Status" section above. Currently the WWTP cannot treat the wastewater to a level that would meet the phased ammonia nitrogen limits of NPDES Permit Number MI0057737. There are no ground water or surface water quality problems associated with the WWTP and the current discharge limits.

5. Projected Needs for the Next 20 Years

The City of Charlevoix Wastewater Treatment Plant uses the activated sludge process to treat wastewater from the City of Charlevoix and the Townships. Due to the recent modifications to the Charlevoix WWTP NPDES Permit, the current treatment facility is not able to meet the new seasonal discharge requirements. As such, significant

expansion of or improvements to the treatment processes are necessary. In addition, the 40-year old plant is in need of improvements to meet current design and safety standards and to reduce the time and expense required for operation and maintenance.

The proposed project would bring the plant up to current design and safety standards while making the necessary improvements to meet the 20-year needs of the WWTP. Increasing the nominal treatment capacity of the WWTP is not included in the proposed project.

5. Future Environment without the Proposed Project

Without implementation of the proposed treatment plant improvements, the water quality of Lake Michigan could be affected due to the aging infrastructure, lack of redundancy, old and deteriorating equipment, inadequate controls, and the plant effluent not meeting the MDEQ NPDES discharge limits.

E. Population Data

The historical (U.S. Census) and estimated future population projections for Charlevoix County have been developed by the Northwest Michigan Council of Governments and are presented in Table 1. Historical (U.S. Census) populations for the City of Charlevoix and the townships are provided in Table 1. Population projections for the City and adjacent townships were developed based on historical trends. Service population estimates and projections are in Table 2.

The City of Charlevoix estimates that the typical population of 2,500 – 3,000 persons swells at times to more than 10,000 during the summer tourism months (mainly July and August). This increase also is observed in the wastewater flows, as the average day flow increases about 50-percent during the main tourism season (based on 2009-2011 data). This

inflated average day flow, as well as the maximum daily flow, falls within the existing nominal capacity of the Wastewater Treatment Plant.

F. Environmental Setting

The MDEQ requires the applicant to make contact with several organizations to determine if there will be any cultural or natural environmental impact by the proposed construction activities. Pursuant to MDEQ guidelines, correspondence with these cultural and environmental agencies indicating the location and scope of the proposed work activities was initiated and completed.

1. Cultural Resources

The proposed project will occur on a site which has housed the City of Charlevoix Wastewater Treatment Plant since 1972. The area surrounding the Wastewater Treatment Plant does not contain any known historic or archaeological sites based on the applicant's initial review of available information. The Michigan State Historic Preservation Officer (SHPO) has been contacted to determine if any historic sites could be impacted. As demonstrated in Appendix F, it is the opinion of the SHPO that "no historic properties are affected."

Information regarding this project also has been forwarded to the local Tribal Historic Preservation Officers for their review. Correspondence is included in Appendix G. Finally, the regional planning agency, the Northwest Michigan Council of Governments (NWMCOG), was informed of the project. The NWMCOG "does not believe that the funding request nor its implementation, negatively impacts any NWMCOG policies, plans, or programs." Correspondence is included in Appendix H.

2. The Natural Environment

a. Climate

Climatological information was obtained from the National Oceanic & Atmospheric Administration station located in Petosky, Michigan, which is at similar elevation, on the shores of Lake Michigan, approximately sixteen (16) miles northeast of Charlevoix, MI.

Averages	Summer	Winter
High Temperature	75	28
Low Temperature	59	12
Mean Temperature	67	20
Precipitation (inches)	18.69	12.46
Seasonal Snowfall (inches)		117.1

The climatological information is based on historical data from 1971-2000.

b. Air Quality

According to the MDEQ, Air Quality Division, Charlevoix, MI currently is designated “Attainment” with the National Ambient Air Quality Standards (NAAQS) for carbon monoxide, nitrogen dioxide, ozone, sulfur dioxide and particulate matter less than ten microns. This is in accordance with the Michigan State Implementation Plan.

c. Wetlands

The Charlevoix County Final Wetland Inventory map containing the City of Charlevoix Wastewater Treatment Plant site is included in Appendix I. The wetlands data is an October 2006 compilation of the National Wetland Inventory conducted by the United States Fish and Wildlife Service, land cover as mapped

by the Michigan Resource Inventory System (MIRIS), MDNR, and soils as mapped by the United States Department of Agriculture, Natural Resource Conservation Service. The Final Wetland Inventory map was obtained from the Michigan Department of Environmental Quality website and illustrates various classifications of wetlands within Charlevoix County.

Appendix I also includes a smaller scale map of the Wastewater Treatment Plant site from the MDEQ Wetlands Map Viewer website. The maps indicate that, within the project area, there are no wetlands as identified on MWI and MIRIS maps and no soils areas that include hydric soils.

d. Coastal Zones

The proposed project site is near the shoreline of Lake Michigan as shown in the study area and service area map in Figures 1 and 2. However, the project will not affect shore land that is included in the Coastal Barrier Resources System as all activity will occur on the existing, developed Wastewater Treatment Plant site. The Critical Dunes map is provided in Appendix J.

e. Floodplains

There is no Federal Emergency Management Agency (FEMA) floodplain map for the site of the City of Charlevoix Wastewater Treatment Plant in Charlevoix Township. The FEMA Floodplain Map for the City of Charlevoix proper is included in Appendix K. The lowest point on the project site is along the north side of the plant along Lake Shore Drive; it is at approximately elevation 590 feet. The water surface of Lake Michigan is approximately Elevation 580 feet.

There are no other water bodies near the Wastewater Treatment Plant; therefore, the proposed work site is not in the floodplain.

f. Natural or Wild and Scenic Rivers

There are no natural, wild or scenic rivers in the project area. This determination is based on a review of the Michigan Department of Natural Resources database for the project study area.

g. Major Surface Waters

The major surface water bodies near the project study area are Lake Michigan, Round Lake and Lake Charlevoix. A map of the Lake Charlevoix Watershed is included in Appendix L. The map shows that the Wastewater Treatment Plant is outside the Lake Charlevoix Watershed and over 200 feet from the shoreline of Lake Michigan. No other surface water bodies are near the plant.

h. Recreational Facilities

The City of Charlevoix and neighboring communities have many outdoor activities to offer. Descriptions and maps of the City of Charlevoix's parks and recreational facilities are provided in Appendix M.

i. Topography

The area is located on the shores of Lake Michigan, Round Lake and Lake Charlevoix. The highest elevation in the study area is roughly 670 feet. The water elevation at Lakes Michigan, Round, and Charlevoix is approximately 580 feet as the ground slopes generally northward through the study area.

All surface water runoff in the study area is directed toward one of the three lakes listed previously. A topographic map is shown in Appendix N.

j. Geology

According to the USGS Summary of Hydrogeologic Conditions by County for the State of Michigan, glacial aquifers consist of sand and gravel that are part of Pleistocene glacial deposits. The glacial deposits typically are 200 to 400 feet thick and include lacustrine, till and outwash. Sand and gravel lacustrine deposits and coarse-grained till are present in the study area. The City of Charlevoix obtains its drinking water from and discharges its treated wastewater to Lake Michigan. Therefore, groundwater and glacial well transmissivity will not be impacted by the proposed project, nor will any geological structures or formations affect the choice of project alternatives.

k. Soils

The soils in the area of the Wastewater Treatment Plant may generally be described as Alpena gravelly sandy loam, 0 to 6 percent slopes, according to the USDA NRCS Web Soil Survey. This soil is described as excessively drained with a “high to very high” capacity of the most limiting layer to transmit water. These soils are highly permeable such that water tends to infiltrate the soils and runoff potential is low. A map of the Web Soil Survey and the map unit description for the project area is attached as Appendix O. As a part of the final design process, soil borings will be performed throughout the site. These soil borings will be useful in determining soil types, depth to groundwater, and soil stability.

l. Agricultural Resources

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. When treated and managed using acceptable farming methods, it has the soil quality, growing season, and moisture supply needed to economically produce a sustained high yield of crops. Prime farmland produces the highest yields with minimal inputs of energy and economic resources, and farming this land results in the least damage to the environment. Examples of such crops are citrus, tree nuts, olives, cranberries, fruit, and vegetables.

A map of the existing Land Use/Zoning District Map for Charlevoix Township (in which the WWTP is located) is shown in Appendix C.

Prime farmland may now be cropland, pastureland, rangeland, or woodland, or it may be in other uses, but it is not urban and built-up land or water areas. No agricultural land is present in the proposed project area as noted in the various zoning maps (Appendix C) and future land use maps (Appendix P).

m. Fauna and Flora

A review of the United States Fish and Wildlife Service technical assistance website was conducted on November 21, 2012. According to the "County Distribution of Michigan's Federally Threatened, Endangered, Proposed, and Candidate Species" list provided by the website, six (6) species are listed and may be present in Charlevoix County. These include the following:

- Piping Plover (Endangered)

- Piping Plover (Critical Habitat Designated)
- Dwarf Lake Iris (Threatened)
- Houghton's Goldenrod (Threatened)
- Michigan Monkey-Flower (Endangered)
- Pitcher's Thistle (Threatened)

In addition, a review of the Michigan Natural Features Inventory was completed by King & MacGregor Environmental, Inc. on November 21, 2012, for Town 34N, Range 08W, Section 28. The MNFI Web Database Search indicated the following three (3) special concern species are listed for Section 28:

- Eastern Flat-Whorl
- English Sundew
- Spike-Lip Crater

A complete list of these flora and fauna can be found in Appendix Q.

n. Unique Features

The City of Charlevoix is unique in that it is a small town located on three lakes – Lake Michigan, Round Lake, and Lake Charlevoix. The immense amount of water in such close proximity to the city and the pleasant summer weather make Charlevoix a highly popular tourist destination.

II. ANALYSIS OF ALTERNATIVES

A. Identification of Potential Alternatives

The objective of the proposed project is to improve the treatment processes to enable compliance with the stringent phased discharge permit limits, specifically for ammonia

nitrogen, bring the WWTP into compliance with current design and safety standards, and reduce the time and expense needed for operation and maintenance. A general WWTP basis of design is provided as Table 7, including both the present values (based on 2009 to 2012 data) and 20-year projections for flow, influent BOD, primary effluent BOD, influent ammonia, influent temperature, raw biosolids and digested biosolids.

The MDEQ proposed ammonia limits are 20 mg/L for December through March, 13 mg/L in April, 5.4 mg/L for May through September, and 12 mg/L for October and November. At present and with the current treatment process optimized, the WWTP is able to meet the discharge limits during the warmer temperature months. However, when average water temperatures drop below 50°F, nitrification for ammonia removal is not possible. Therefore, each alternative considered must include means to address the ammonia removal issues during periods when wastewater temperatures are low.

1. No Action

No action will result in failure to meet the requirements of the NPDES permit, further deterioration of structures and equipment, reduced reliability of the WWTP as it continues to age and increased operation and maintenance costs. Therefore, this alternative does not meet the compliance requirements and will not be considered further.

2. Regional Alternatives

The project plan is required to include an investigation of any possible regional wastewater system alternatives.

The only comparable wastewater treatment system in the area is the City of Petoskey. The City of Petoskey, however, is located about fifteen miles east-northeast of Charlevoix.

A regional alternative is not practical or economically feasible. The cost to upgrade the wastewater treatment facility is significantly less than the cost to obtain this service from another community and reconfigure the City's infrastructure. Therefore, this alternative will not be considered further.

3. Basic Plant Improvements

Because the plant is about 40 years old, some of the plant units require upgrading to maintain reliability and to meet current design and safety standards. Also, some improvements will be cost effective to reduce the time and expense required for operation and maintenance.

The following is a description of proposed improvements. They are called Basic Plant Improvements because they are recommended for all the viable alternative projects that are being considered. In addition to the description below, Table 8 contains a listing of the plant units that need improvement and a reference to the reason for the improvement.

a. Headworks

<u>Screens</u>

Dual screens are proposed to provide redundant screen capacity. Finer mesh is proposed to improve the removal of particulate material. In the case of the MBR alternate (described below) a second set of screens with much finer mesh is proposed.

Grit Classifier

Repair or replacement of the grit classifier is recommended to improve plant performance.

Meter

A redundant meter is proposed to be located at the effluent flume in conjunction with the proposed UV disinfection chamber.

Bio-Filter

A bio-filter is proposed to control odors that originate in the headworks and the sludge holding tanks.

b. Primary Settling

Repairs

As described above, it is recommended that the second primary settling tank be drained, repaired, recoated and the mechanical equipment be replaced.

Piping

Piping revisions are proposed so that the plant will perform as a single unit rather than two separate trains as it is configured at present.

FRP Covers

Covering the primary settling tanks is recommended to maintain wastewater temperatures and to facilitate odor control.

c. Aeration

Aeration improvements will depend on the alternate chosen from those described below.

d. Final Settling

As described above, it is proposed that both final settling tanks be drained, repaired and recoated, and the mechanical equipment be replaced. However, if Alternate 3 (MBR) is selected, final settling tanks will not be required to be part of the process and they could be removed from service.

e. Disinfection

As described above, it is proposed that disinfection be converted from chlorine to ultra-violet.

f. Sludge Digesters

As described above, it is proposed that the sludge digesters be drained, repaired if necessary, and recoated. In addition, the transfer pump should be replaced.

g. Sludge Thickening

It is proposed that a new process unit be added to the plant to provide thickening of the sludge prior to digestion. This process will reduce the sludge volume in the digestion process and will reduce the volume of supernatant that must be returned and treated in the plant process.

h. Sludge Storage

Storage for digested sludge is proposed so that the plant operators will have more ability to choose the timing of sludge disposal to farm land. This will allow the

operators to avoid disposal to farm land when the time of year makes it inconvenient or impossible. Preliminary calculations indicate that 200,000 gallons to 300,000 gallons storage tank will provide adequate volume.

i. Administrative Functions and SCADA

At the present time, plant administrative functions including record keeping, office functions, laboratory and Supervisory Control and Data Acquisition (SCADA) facilities are accommodated in cramped quarters that have been remodeled from previous uses.

It is proposed to construct a separate administration building that could include the functions described above as well as a conference room, lunch room, restroom facilities and other conveniences of modern business technology. In addition, it is proposed that the plant SCADA facilities be upgraded with the server housed in the proposed administration building.

j. Odor Control

Odors associated with the treatment processes can be very obnoxious. Plant processes that produce odors include the headworks, the primary settling tanks and the biosolids treatment units. A bio-filter is recommended to control the odors. Foul air will be collected and discharged through a biologically active filter.

k. Site Lift Station Force Main

The onsite lift station receives various flows from within the wastewater treatment plant. The force main discharge is currently to the primary clarifiers. It

is proposed to reconfigure the lift station and force main to redirect flows to the headworks for preliminary treatment and solids removal.

l. Electrical and HVAC

Appendix R contains detailed assessment of the plant's electrical, heating and ventilation facilities. Recommendations for improvement of these facilities are contained in this appendix.

4. Alternate 1: Optimum Performance of Existing Facilities

The City of Charlevoix currently performs all operation, maintenance, and repair within its collection system and pumping and treatment facilities. Components of the operation, maintenance, and repair programs include sewer cleaning and jetting, sewer televising, sewer repairs, weekly, monthly, and annual inspections of lift stations and lift station components, and all necessary activity at the WWTP.

Investigation into a source of ammonia in the wastewater treatment collection system service area has not resulted in the identification of a single large source or multiple sources that could be controlled.

The existing facilities are being operated as efficiently as is reasonably possible. As stated previously, operational changes were made to the treatment process in Year 2012 to improve the effluent ammonia quality. However, the adjustments were not sufficient to allow the WWTP to meet the revised discharge limits even with warmer-than-typical winter wastewater temperatures in 2012.

Basic plant improvements still would be required to bring the WWTP to current design and safety standards. Table 9 contains the work that would be included in this alternate

including the reference for their inclusion in the process and cost estimate for comparison purposes.

The City currently has to operate the full plant, with no redundancy and no opportunity to perform maintenance, in order to maximize ammonia removal. As such, the recent modifications to the NPDES permit have rendered the existing facility incapable of achieving the future effluent ammonia limits. Therefore, the alternative to optimize the existing facility would not be effective at meeting the permit discharge limits without additional treatment processes.

5. Alternate 2: Conventional Activated Sludge Upgrade

The schematic design for the conventional activated sludge upgrade alternate is shown in Figure 6. Table 10 contains a listing of the process units that would be included in this alternate including the reference for their inclusion in the process and cost estimate for comparison purposes.

This alternate considers maintaining the present activated sludge process but expanding and upgrading some of the units to attempt to accommodate the new NPDES limits.

a. Basic Elements

The Basic Plant Improvements described above are included in this alternate.

b. Additional Aeration Tanks

In order to comply with Ten States Standards, the aeration tanks must be increased to 311,000 cubic feet from their present volume of 31,200 cubic feet. This large increase in volume makes this option impractical.

c. Air Systems

Blowers, air diffusers and air piping assemblies must be increased in proportion to the increase in the aeration tank volume.

d. Ammonia Removal Limitation

Alternate 2 would address ammonia removal issues during those periods when wastewater temperatures are favorable. This alternate is not viable during low water temperature periods without supplemental means of maintaining wastewater temperatures. Therefore, the alternative to optimize the existing facility and construct additional aeration facilities and systems will not be considered further.

6. Alternate 3: Advanced Treatment

The third alternate considers implementing an advanced treatment process to enhance ammonia removal to meet the new NPDES limits. Advanced treatment options include Activated Sludge with Fixed Film Aeration (e.g. Mixed Bed Bio-Reactors or Integrated Fixed-Film Activated Sludge) and Membrane Bioreactor.

Schematic diagrams illustrating the potential Alternate 3: Advanced Treatment processes, e.g. Fixed Film Aeration and Membrane Bioreactor, are provided in Figure 7 and Figure 8, respectively. The process units, reference and cost estimate for the Advanced Treatment alternate are shown in Table 11.

a. Basic Elements

The Basic Plant Improvements described above are included in Alternate 3.

b. Additional Aeration Tanks

Additional aeration tanks as described in Alternate 2 may also be included in Alternate 3, depending on the type of Advanced Treatment selected.

c. Air Systems

Additional blower capacity, air diffusers and air piping systems may be required in proportion to the increase in aeration tank volume.

d. Piping Systems

Piping systems are required for the potential aeration tank expansion including influent, effluent, return activated sludge, waste activated sludge and the air systems. In addition, return activated sludge and waste activated sludge pumps would be required.

e. Fixed Film Media

Various forms of fixed film media could be used in the Fixed Film Aeration option under Advanced Treatment. The critical design issue for Charlevoix will be selecting a fixed film that will perform satisfactorily under their relatively cool water conditions that prevail during the winter. See Figure 7 process schematic.

f. Membrane Bio-Reactor (MBR)

A schematic diagram showing the MBR advanced treatment option is shown in Figure 8. The MBR option under the Advanced Treatment alternate system would use microfiltration and/or ultrafiltration membranes to replace the final settling tanks. An advantage to the MBR system is a much reduced footprint for the aeration tanks and a much improved effluent quality. The higher concentration of

microorganisms and the MBR system would enhance the ability to remove ammonia.

B. Analysis of Principal Alternatives

1. The Monetary Evaluation

Detailed cost estimates for each alternate are included in Tables 9-11. A present worth analysis also is included for the project alternatives. The present worth analysis seeks to show a monetary comparison of costs for the alternatives and the direct impact to sewer users. Factors that are included in the analysis are:

- Capital Costs
- Capitalized Interest Costs
- Operation, Maintenance, and Replacement (OM&R) Costs
- Revenue Generated
- Salvage Value of Treatment Works
- Discount Rate Set by the EPA.

Several of the factors above are fixed known costs (Capital, Interest, and Salvage Value). Several other factors are variable and are estimated based on best available data (OM&R and Revenues). It is anticipated that with improvements to the system, OM&R will be reduced. Estimates are used but actual costs will not be known until the work has been completed and real data are available. The increase in the OM&R will have an end effect of increasing the overall cost to the end user. Appendix S shows the present worth analysis for each alternate discussed. The cost estimates include all costs associated with engineering, construction and mitigation if necessary.

In summary, the monetary evaluation results are as follows:

The approximate total project cost for Alternate 1: Optimum Performance of Existing Facilities, including the Basic Plant Improvements, is $7,403,500. This alternate would not provide the ability to meet NPDES permit limits.

The estimated total project cost for Alternate 2: Conventional Activated Sludge Upgrade, including the Basic Plant Improvements, is $9,645,000. This alternate may not be able to meet NPDES permit during cold weather.

The estimated total project cost for Alternate 3: Advanced Treatment, including the Basic Plant Improvements, is $10,895,000. This alternate would bring the WWTP up to current design and safety standards, as well as provide treatment to meet all NPDES permit requirements.

2. Staging Construction

The design life of the project is not less than 20 years and will not result in the need for more work soon after the project is complete. Therefore, it would be neither cost effective nor preferable to stage the construction around environmental considerations, uncertain future population projections, economic conditions or future treatment requirements.

3. Partitioning the Project

Partitioning of the project is not necessary.

4. The Environmental Evaluation

The MDEQ requires the applicant to make contact with several organizations to determine if there will be any cultural or natural environmental impact by the proposed construction activities. Pursuant to MDEQ guidelines, correspondence with these

cultural and environmental agencies indicating the location and scope of the proposed work activities was initiated and completed.

a. Cultural Resources

The area of the Wastewater Treatment Plant does not contain any known historic or archaeological sites based on the applicant's initial review of available information. The project will not be disturbing any areas of local, state, or national significance, and it is believed that no historic or archaeological sites will be impacted by the construction of the proposed project. The SHPO has been contacted to determine if any historic sites could be impacted by the proposed project and it found that "no historic properties are affected."

The local Tribal Historic Preservation Officers were contacted and correspondence is included in Appendix G. Finally, the Northwest Michigan Council of Governments indicated it "does not believe that the funding request nor its implementation, negatively impacts any NWMCOG policies, plans, or programs." Correspondence is included in Appendix H.

b. The Natural Environment

Climate

Implementation of any of the proposed project alternates would not be impacted by the local climate.

Air Quality

The proposed project alternates would not negatively impact the present air quality "attainment" designation in the affected areas. Any anticipated growth in

and expansion of the sewer service area in the City or adjacent townships will not negatively impact the air quality in the area.

Wetlands

The wetland maps in Appendix I indicate that there are no wetlands in the project area as identified on MWI and MIRIS maps and no soil areas that include hydric soils. Construction staging and construction activity areas are not within any wetland boundaries.

Coastal Zones

The project will not affect shore land that is included in the Coastal Barrier Resources System as all activity will occur on the existing, developed Wastewater Treatment Plant site. Nevertheless, a review was completed to determine the potential impact on critical dunes and/or high risk erosion areas.

A review of the Charlevoix Township Critical Dune Areas map (dated February 17, 1989) indicated that there are no critical dunes in the area of the Wastewater Treatment Plant. The Critical Dunes map is provided in Appendix J.

A review of the MDEQ High Risk Erosion Areas Digital Maps website indicated that there are no high risk erosion areas in Charlevoix Township or Charlevoix County.

As a result, it is concluded that the proposed Wastewater Treatment Plant improvements project will not impact any coastal zone, critical dune area, or high risk erosion area.

Floodplains

Neither the proposed project nor its alternates is near a water body such that a floodplain would be impacted.

Natural or Wild and Scenic Rivers

There are no natural, wild or scenic rivers in the project area or that would be impacted by the proposed project alternates. This determination is based on a review of the Michigan Department of Natural Resources database for the project study area.

Major Surface Waters

No surface water bodies are within the area of immediate impact from the proposed project, although the shoreline of Lake Michigan is located a minimum of 200 feet north of the WWTP site. Extensive soil erosion and sedimentation control measures would be installed along the north site limits to protect Lake Shore Drive and Lake Michigan. Therefore, neither of the proposed project alternates would impact the natural surroundings and surface water bodies.

Recreational Facilities

The City of Charlevoix and neighboring communities have many outdoor activities to offer; none would be affected by the proposed project alternates.

Topography

Any changes to the Wastewater Treatment Plant site with the proposed project or alternates will not impact the overall slope or drainage characteristics of the area.

Geology

Groundwater and glacial well transmissivity will not be impacted by the proposed project or any alternates, nor will any geological structures or formations affect the choice of project alternates.

Soils

The soils in the area of the Wastewater Treatment Plant neither will be effected by nor will they influence the selection of a project alternate. During the design process, soil borings will be taken throughout the site. These soil borings will be useful in determining soil types, depth to groundwater, and soil stability.

Agricultural Resources

No prime or agricultural farm land is present in the project area nor might be impacted by the proposed project alternates as noted in the various zoning maps (Appendix C) and future land use maps (Appendix P).

Fauna and Flora

As discussed previously, six (6) of "Michigan's Federally Threatened, Endangered, Proposed, and Candidate Species" are listed and may be present in Charlevoix County. In addition, three (3) special concern species are listed for Section 28 of Charlevoix County. However, the proposed work activities are confined to the existing wastewater treatment plant site. Ground disturbance will be limited to the area bounded by the perimeter security fence and will not impact any previously unaltered areas. As the proposed work will be limited to existing buildings, parking areas, and developed lawns, it is determined that the proposed

construction has practically no likelihood of supporting federal or state rare or protected species. For these reasons, it is concluded that the WWTP Improvements project will not affect any listed species, their habitats, or proposed or designated critical habitat.

A complete list of these flora and fauna can be found in Appendix Q.

Unique Features

These valuable qualities of an immense amount of water in close proximity to the City and the pleasant summer weather found in the study area will not be adversely impacted by the proposed project or alternates. Instead, construction of the proposed project will ensure that the City and adjacent Townships will continue to have an efficient, sustainable wastewater treatment facility that can meet all permits and regulations at present and going forward into the future.

5. Implementability and Public Participation

Construction phasing will be required to maintain operation of the existing treatment processes while constructing the new facilities. There is adequate space on the WWTP site to construct the new facilities without impacting the existing. All new structures and equipment will be tested and approved prior to placing in service.

The proposed project will require financial involvement on the part of the City and Townships. The financial burden will be fully evaluated as part of the user charge system study and financial analysis.

The City of Charlevoix manages the operation and maintenance of the existing wastewater treatment plant and will continue to perform all OM&R roles with the

proposed improvements. City personnel and consultants have the ability to manage construction projects on the magnitude of the proposed improvements.

6. Technical and Other Considerations

a. Infiltration and Inflow (I/I) Removal

As discussed previously, I/I rates in the City of Charlevoix wastewater collection system are not excessive. Additionally, there are no known instances of precipitation events causing wastewater backup problems, overflows or poor treatment performance due to hydraulic overloading. Therefore, I/I removal is not included in the proposed project.

b. Sludge and Residuals

The sludge and residuals process of the existing WWTP will be maintained and improved as part of the basic plant improvements. Additional sludge storage is proposed to allow operators to choose the timing of sludge disposal to farm land.

c. Industrial Pretreatment

No industrial pretreatment facilities are in place at present nor will they be required for the proposed improvements.

d. Growth Capacity

The proposed project does not include increasing the wastewater treatment capacity above current levels. Average and peak daily flow projections indicate that needs during the 20-year planning period can be met without increasing the plant capacity.

e. Areas Currently Without Sewers

The proposed project alternatives do not include serving areas currently without sewers.

f. Reliability

The basic plant improvements are critical to maintaining the reliability of the existing WWTP; they are needed to extend the useful life expectancy of the plant beyond the 20-year planning period. Both the fixed film aeration and the membrane bio-reactor process options for Advanced Treatment are reliable and have the ability to meet and consistently maintain permit limitations throughout useful life of the project.

g. Alternative Sites and Routings

The site of the proposed project is the site of the existing Wastewater Treatment Plant. Selection of an alternative site for the facility would not be cost effective.

h. Combined Sewer Overflows

There are no combined sewers in the Charlevoix system; therefore, the proposed project does not include treatment capacity or facilities to handle combined flows.

i. Contamination at the Project Site

There is no known contamination at the treatment plant site. Any contamination discovered during design or construction will be disposed of properly according to all local, State and Federal regulations.

III. SELECTED ALTERNATIVE

A. Description of the Selected Alternative

The proposed wastewater system improvement project is located at the City of Charlevoix Wastewater Treatment Plant. Following is a description of the selected alternative:

Project Description

Construct Basic Plant Improvements and Alternate 3: Advanced Treatment.

The table below is a schedule for the proposed wastewater treatment plant improvement project.

Proposed Project Schedule

Milestone	Date
Hold Public Hearing	June 3, 2013
Submit Final Project Plan to MDEQ	June 21, 2013
Submit User Charge System to MDEQ	July 2013
Receive Approval of Project Plan	September 2013
Submit Plans and Specifications to MDEQ	December 2013
Receive Construction Permit	February 2014
Receive Construction Bids	February 2014
SRF Loan Awarded	April 2014
Begin Construction	May 2014
Construction Completed	October 1, 2015

1. Relevant Design Parameters

The selected Alternate 3: Advanced Treatment will include either Activated Sludge with Fixed Film Aeration or Activated Sludge with Membrane Bioreactor (MBR). The precise treatment process and unit processes and sizes will be determined during preliminary design.

The Activated Sludge with Fixed Film Aeration option would include the following elements:

- Basic Plant Improvements.
- Additional aeration tanks.
- Air systems including air diffuser assemblies and blowers.
- Piping systems including piping for influent, effluent, return activated sludge (RAS), waste activated sludge (WAS), and air, and RAS/WAS pumps.
- Fixed film media system.

The Fixed Film Aeration process could include the treatment sub-categories of Mixed Bed Bio-Reactors (MBBR) or Integrated Fixed-Film Activated Sludge (IFAS).

The Activated Sludge with Membrane Bioreactor option would include the following elements:

- Basic Plant Improvements.
- Additional aeration tanks.
- Complete membrane system, including process aeration blowers and membrane aeration blowers, diffusers, chemical skid(s), RAS pumps, WAS pumps and valves.
- Fine screens.
- Piping systems

Further detailed evaluation of MBR, MBBR and IFAS will be completed by September 2013 to comply with the NPDES permit requirements.

The unit processes will be sized to meet the 20-year projected service area needs. As discussed previously, this will not require increasing the WWTP capacity.

Schematic flow diagrams of the Advanced Treatment process options are included in Figure 7 and Figure 8.

A general WWTP basis of design including the principal design criteria is provided in Table 7, showing both existing values and 20-year projections for flow, influent BOD, primary effluent BOD, influent ammonia, influent temperature, raw biosolids and digested biosolids.

WWTP residuals will be handled as at present, although additional sludge storage is proposed to provide flexibility in scheduling land application.

2. Controlling Factors

The Advanced Treatment alternate will be designed according to the WWTP Basis of Design (Table 7). The proposed treatment capacity will not exceed the existing capacity and will be sufficient to meet the needs of the 20-year projected service area population. Characteristics of the influent wastewater and treatment residuals are provided in Appendix D.

An Advanced Treatment process is required to meet the NPDES permit requirements and the proposed effluent limits, especially during the cold weather months when nitrification of ammonia is not possible with the existing conventional activated sludge process.

3. Special Assessment District Projects

A special assessment district will not be utilized for the proposed project.

4. Project Maps

Schematic diagrams of the Advanced Treatment alternative are included in Figure 7 and Figure 8.

5. Sensitive Features

No sensitive features are in the area impacted by the proposed project.

6. Schedule for Design and Construction

The proposed project schedule is provided in Section III.A. above.

7. Cost Summary

Tables 9-11 contain cost estimates for the proposed wastewater system improvements. The project costs include construction costs and approximately 30 percent for contingency costs, project engineering and legal/financial/bond counsel.

B. Authority to Implement the Selected Alternative

The City of Charlevoix provides wastewater treatment service to all City and Township customers and therefore has the authority to implement the proposed project. Discussions will be held with and input received from the Townships pertaining to the need for the project, rate increases and schedules.

C. User Costs

The MDEQ requires the applicant to perform a Present Worth analysis of the various options. The Present Worth analysis uses discount factors that reduce the annual expenses compared to what the actual annual bond payment would be. Appendix T includes the annual cost computation which is a worst case scenario where the proposed bond payment includes the anticipated expenses related increases in operation, maintenance and

replacement. The City of Charlevoix is planning on funding the proposed $10,895,000 project with a SRF loan at a 2.50 percent interest rate for a 20-year period. The expected annual debt service for the proposed projects based on the SRF loan criteria will be approximately $763,883 per year.

The increase due to the improvements translates to an annual cost of $266.63 per REU or about $22.22 per month for both In-City and rural (Township) residents. Current typical quarterly sewer rates for residential customers in the City of Charlevoix sanitary sewer system are about $110.

The City of Charlevoix intends to maintain their current rate structure for rural (Township) and In-City customers and raise rates as necessary for the proposed project. The rate structure is based on the City's most recent cost-of-service study done in 2008 by Utility Financial Solutions of Holland, MI. The current rate structure along with a low interest loan will allow the communities to "pay as they go" to finance the projects.

D. Disadvantaged Community

The median household income in the City of Charlevoix is $48,704, according to the 2010 US Census. At this income level, the City of Charlevoix would not qualify as a disadvantage community under the SRF program.

E. Ability to Implement the Selected Alternatives

Implementation of the proposed project is based on the assumption that the project will be financed by a low-interest loan from the SRF program. The City of Charlevoix has the necessary legal, institutional, financial, and managerial resources available to ensure the construction, operation and maintenance of the proposed facilities.

1. Financials

The City of Charlevoix will raise rates as necessary to pay for the proposed debt service for the bonding period of twenty years.

2. Design/Permits

All projects will be under design later in 2013 and will be submitted prior to the required deadline.

IV. Evaluation of Environmental Impacts

A. General

The anticipated environmental impacts resulting from the construction of the selected project alternative include beneficial and adverse, short and long-term, and irreversible and irretrievable. Following is a discussion of the anticipated environmental impacts of the selected plan.

1. Beneficial Impacts

- Construction activities associated with the wastewater treatment plant improvements would occur exclusively on City-owned property at the existing WWTP site; this will minimize disturbance to residents.
- Construction and equipment manufacturing related jobs would be created.
- Local contractors would have an equal opportunity to bid on the construction contracts.
- Water quality would be improved.
- No additional development of land would be necessary due to the proposed wastewater system improvements.
- No construction of new roads would be necessary.

- Improvement of existing structures on the WWTP site.
- No increased storm water runoff.
- No detrimental impacts on air quality.
- Improved soil erosion control.
- No negative impact on the surrounding groundwater.
- No impact on historical sites, archaeological sites, cultural sites, or recreational areas.
- No impact on threatened or endangered species.
- Reduced consumption of energy and natural resources due to improved process efficiencies.
- No disruption to fish and wildlife
- No disruption to fishing and recreational boating
- More reliable wastewater treatment system
- No work in wetlands or in the floodplain.

2. Adverse Impacts

- Noise and dust would be generated during construction of the project.
- Minor traffic disruptions may occur during construction.
- Short-term increased use of energy and natural resources.

3. Short and Long-Term Impacts

The short-term adverse impacts associated with construction activities would be able to be mitigated and would be minimal in comparison to the resulting long-term beneficial impacts.

a. Short Term Adverse Impacts

- Traffic disruption.
- Dust and noise.
- Increased energy consumption.

b. Short Term Beneficial Impacts

- No disruption to fishing and recreational boating.
- No disruption to fish and wildlife.
- Construction activities associated with the wastewater treatment plant improvements would occur exclusively on City-owned property at the existing WWTP site; this will minimize disturbance to residents.
- Construction and equipment manufacturing related jobs would be created.
- Local contractors would have an equal opportunity to bid on the construction contracts.
- Water quality would be improved.
- No additional development of land would be necessary due to the proposed wastewater system improvements.
- No construction of new roads would be necessary.
- Improvement of existing structures on the WWTP site.
- No increased storm water runoff.
- No detrimental impacts on air quality.
- Improved soil erosion control.
- No negative impact on the surrounding groundwater.

- No impact on historical sites, archaeological sites, cultural sites, or recreational areas.
- No impact on threatened or endangered species.
- Reduced consumption of energy and natural resources due to improved process efficiencies.
- No disruption to fish and wildlife
- No disruption to fishing and recreational boating
- More reliable wastewater treatment system.
- No work in wetlands or in the floodplain.

c. Long Term Adverse Impacts

- None.

d. Long Term Beneficial Impacts

- No negative long term impacts from the proposed project since the improvements are not impacting areas of previously undeveloped land.
- Improved water quality.
- Provide for long-term development in the service area.
- A more reliable wastewater treatment facility.
- No increased storm water runoff.
- Improvement of storm water quality.
- Improved soil erosion control.
- No impact on historical sites, archaeological sites, cultural sites, or recreational areas.
- No impact on threatened or endangered species.

- Recycle and reuse natural resources.

B. Analysis of Impacts

1. Direct Impacts

The construction of the proposed project should have no effect on historical, archaeological, geographic, cultural or recreational areas, as all construction activities will be confined to an existing, currently developed site. Previously referenced figures show the proposed construction location for the project.

The project will not detrimentally affect the water quality of the area, air quality, wetlands, endangered species, or wild and scenic rivers. No residents or businesses would be relocated.

The majority of the construction will occur outside of the existing road pavement so residents and business owners will not be significantly impacted by the construction since the roads will remain open during construction.

The SRF program requires competitive bidding for all projects. This will allow a larger number of contractors to bid on the projects compared to projects that would be solicited to a short list of contractors.

The proposed project is not intended to extend or construct a new road(s) to previously undeveloped lands within the work area. The proposed work is to improve an existing wastewater treatment facility to better serve its existing and future customers.

In some cases, portions of the existing road and/or driveways may need to be replaced due to underground activity on the WWTP site. Reconstruction of existing

road/driveways would bring them into current standards of road construction and improve safety.

As part of the construction document, the contractors will be required to use more environmentally sound fuels. Contractors would be required to use “Green” fuels such as “Ultra Low Sulfur Fuel” or “Bio Diesel” in their trucks and equipment. Currently, some equipment is allowed to use “Low Sulfur Fuel” under current Federal regulations. The use of Ultra Low Sulfur Fuel and Bio-diesel will cut diesel emissions by up to twenty percent compared to current low sulfur fuels. The use of the “Green” fuels will improve air quality.

Bio-diesel is made from corn which is a renewable energy source. This will require less use of crude oil based diesel fuel.

The asphalt used for re-construction of existing road will be required to use a minimum of twenty percent recycled asphalt removed from other projects. The use of the recycled asphalt requires less use of non-renewable resources like oil that is the base material for the liquid asphalt.

2. Indirect Impacts

The proposed wastewater facilities are sized to provide service for 20 years of future growth in the study area based on current trends and anticipated growth. Future growth in the study area will not greatly alter the character of the area. Future growth would be subject to conformance with the land use and zoning plans of the City of Charlevoix and Charlevoix, Marion, and Hayes Townships.

3. Cumulative Impacts

Providing to the customers of the system a more reliable wastewater treatment facility with new, updated equipment and structures able to meet the discharge permit requirements would be the primary cumulative impact anticipated from the construction of the project.

V. MITIGATION

A. Short Term Construction Related Mitigation

Standard procedures used in the construction industry will be included in the construction contract documents to mitigate construction activities.

1. Traffic Disruption

All of the proposed work is outside of road pavement on the existing developed WWTP site. This will allow residents to have access to their home and business at all times.

Standard traffic and safety control devices such as barricades and lighted barrels will be in place to warn and protect residents during construction activities.

2. Dust and Noise

Dust control methods such as water and/or brine will be used to keep dust to a minimum. All haul roads and public roadways will be swept daily and maintained to assure residents access to the area. Construction equipment will be maintained in good condition to decrease noise.

3. Soil Erosion

Soil erosion and sedimentation control measures such as straw bales, sedimentation basins, and silt fence, will be part of the construction activities to prevent soil release and protect streams and wetland.

4. Wastewater Service Disruption

During construction of the wastewater system improvement project, sanitary sewer collection and treatment service will be maintained for all residents and businesses in the system. This will be accomplished by maintaining the existing facility in service until the new facilities are constructed, tested, and operational.

5. Work in the Floodplain

No work is proposed in the floodplain.

6. Work in the Wetlands

No work is proposed in wetlands.

B. Mitigation of Long Term Impacts

General mitigation of construction activities in the treatment facility improvements will prohibit the disposal of soils in wetlands, floodplains, or other sensitive areas. Storm sewer catch basins will be protected where earth changing activities will take place.

1. Use of Natural Resources

As a result of the wastewater treatment plant improvements project, natural resources such as gravel, sands, oil, and fuels will be utilized and consumed. To minimize the impact on the natural resources, a number of things will be utilized during the construction.

The use of biodiesel fuels will require less oil than needed to produce similar diesel fuels used in trucks and equipment. Recycled asphalt from reclaimed roads will be used in reconstruction of existing roads and/or driveways. The recycled asphalt will require less liquid asphalt which is made from oil. The use of erosion control measures will be composed of recycled or natural products that do not use or use less synthetic materials made from oil.

2. Energy Use

The use of energy is inevitable in operating a wastewater treatment facility and in the production of materials used for construction. Using recycled or natural eco-friendly products as part of the construction process or during construction will use less energy than compared to using 100-percent nonrenewable resources.

The use of the recycled and/or eco-friendly products will not completely mitigate the use of all energy but it will offset a small percent.

C. Mitigation of Indirect Impacts

1. Master Plan and Zoning

Existing planning and zoning maps are provided in the appendices. As the proposed project alternates are confined to the existing treatment plant site, planning and zoning are not needed to protect historical features or neighborhoods, prime or unique agricultural land, or wetlands, floodplains, stream banks, shore lands or other sensitive features.

2. Ordinances

Ordinances are neither affected nor needed to protect any historical or environmental resources.

3. Staging of Construction

Staging of construction will be carefully planned and utilized to maintain the functionality and operability of the existing WWTP during construction of the proposed improvements.

VI. PUBLIC PARTICIPATION

A. Formal Public Hearing

A public hearing describing the draft project plan along with alternatives, cost estimates, etc, is scheduled to be held on June 3, 2013, at the City of Charlevoix City Hall prior to its adoption by City of Charlevoix. A transcript of the Public Hearing along with the sign in sheet will be included in Appendix U and Appendix V.

A notice of public hearing was published in the local newspaper 30 days before the hearing. A copy of the public notice and affidavit showing the article will be included in Appendix W.

B. Adoption of Project Plan

A copy of the signed City of Charlevoix resolution adopting the proposed Project Plan will be included in Appendix X.

Tables

TABLE 1.
HISTORICAL AND PROJECTED POPULATIONS

Unit of Government	Actual Census Figures					Projected Population				
	1970	1980	1990	2000	2010	2015	2020	2025	2030	2035
Charlevoix City	3,519	3,296	3,116	2,994	2,513	2,438	2,364	2,294	2,225	2,158
Charlevoix Township	720	993	1,016	1,697	1,645	1,793	1,954	2,130	2,322	2,531
Marion Township	694	946	1,130	1,492	1,714	1,885	2,074	2,281	2,509	2,760
Hayes Township	706	1,274	1,317	1,893	1,919	2,092	2,280	2,485	2,709	2,953
Total Study Area	5,639	6,509	6,579	8,076	7,791	8,208	8,673	9,190	9,765	10,402
Charlevoix County (Information Only)	16,541	19,907	21,468	26,090	25,949	26,849	27,634	28,465	29,111	29,439

TABLE 2.
SERVICE POPULATION PROJECTIONS

Unit of Government	Historical REU Est.	Service Population	REU Estimate	Service Population	Projected Service Population				
	2002	2002	2010	2010	2012	2017	2022	2027	2032
Charlevoix City	1,198	2,994	1,005	2,513	2,483	2,408	2,336	2,266	2,198
Charlevoix Township	679	1,697	658	1,645	1,704	1,858	2,025	2,207	2,406
Marion Township	161	403	161	403	419	461	507	558	614
Hayes Township	284	711	284	711	736	803	875	954	1,039
Total Rural (Townships)	1,124	2,811	1,104	2,759	2,860	3,121	3,407	3,718	4,059
Total Service Estimate	2,322	5,805	2,109	5,272	5,343	5,530	5,743	5,984	6,257

TABLE 3.
WWTP CAPACITY ANALYSIS AND COMPONENT CAPACITIES

Year	Average Daily Flow (MGD), Non-Summer	Average Daily Flow (MGD), July-August	Maximum Day Flow (MGD)	WWTP Average Day Flow Capacity (MGD)	WWTP Peak Hour Flow Capacity (MGD)
2012	0.34	0.53	0.69	1	2
2017	0.41	0.60	0.76	1	2
2022	0.47	0.66	0.82	1	2
2027	0.54	0.73	0.89	1	2
2032	0.60	0.79	0.95	1	2

WWTP Component	Capacity
Screen	3/8"
Flow Meter	4 mgd
Grit Collector	NA
Primary Settling (Max Day)	3.75 mgd
Primary Settling (Avg Day)	3.15 mgd
Aeration Tanks	31,200 cf
Final Settling	1 mgd
Disinfection (Detention Time)	53 min
Sludge Digester (Primary)	166,000 gal
Sludge Digester (Secondary)	144,000 gal

N/A indicates information not available.

TABLE 3.
AVERAGE DAY FLOW PROJECTIONS

Unit of Government	Average Daily Flow (MGD)	Average Daily Flow Contribution (gpcd)	Projected Average Daily Flow (MGD)			
	2012	2012	2017	2022	2027	2032
Charlevoix City	0.159	64	0.177	0.192	0.203	0.212
Charlevoix Township	0.109	64	0.137	0.166	0.198	0.232
Marion Township	0.027	64	0.034	0.042	0.050	0.059
Hayes Township	0.047	64	0.059	0.072	0.086	0.100
Total Rural (Townships)	0.183		0.230	0.280	0.334	0.391
Total Average Day Flow, Sept-June (MGD)	0.342	64	0.407	0.472	0.537	0.602
Total Average Day Flow, July-Aug (MGD)	0.53	100	0.60	0.66	0.73	0.79

Flow breakdown by Unit of Government based on each Unit's relative percentage of the total service population.

TABLE 4.
MAXIMUM DAY FLOW PROJECTIONS

Unit of Government	Average Daily Flow (MGD)	Maximum Daily Flow (MGD)	Est. Peaking Factor	Projected Maximum Daily Flow (MGD)			
	2012	2012	2012	2017	2022	2027	2032
Charlevoix City	0.159	0.323	2.03	0.331	0.335	0.337	0.335
Charlevoix Township	0.109	0.221	2.03	0.255	0.291	0.328	0.367
Marion Township	0.027	0.054	2.03	0.063	0.073	0.083	0.094
Hayes Township	0.047	0.096	2.03	0.110	0.126	0.142	0.158
Total Rural (Townships)	0.183	0.371		0.428	0.489	0.552	0.619
Total Flow (MGD)	0.342	0.694	2.03	0.759	0.824	0.889	0.954

Flow breakdown by Unit of Government based on each Unit's relative percentage of the total service population.

TABLE 5.
DETERMINATION OF EXCESSIVE INFILTRATION AND INFLOW

Date of Observed Flow at WWTP	Dry Weather Max Day Flow, mgd	Per Capita Dry Weather Base Rate, gpcd [3]	Exceeds 120 gpcd Dry Weather Threshold?	Wet Weather Max Day Flow, mgd	Per Capita Wet Weather Base Rate, gpcd [3]	Exceeds 275 gpcd Wet Weather Threshold?	Summer Tourism Max Day Flow, mgd	Per Capita Summer Tourism Base Rate, gpcd [4]	Exceeds I/I Threshold Threshold?
Non-Precipitation Days: Mar-May and Sept-Nov [1]									
3/20/2009	0.328	62	NO						
9/18/2009	0.401	76	NO						
4/25/2010	0.387	73	NO						
10/14/2010	0.325	62	NO						
9/18/2011	0.398	75	NO						
10/13/2011	0.371	70	NO						
Wet Weather Events: April-October [2]									
8/29/2009 (1.00")				0.498	94	NO			
9/28/2009 (2.03")				0.519	98	NO			
4/6/2010 (1.23")				0.373	71	NO			
9/24/2010 (2.07")				0.394	75	NO			
6/23/2011 (1.33")				0.506	96	NO			
10/20/2011 (0.91")				0.398	75	NO			
Summer Tourism Flows: July-August									
July 2009							0.720	91	NO

Notes:

[1] Selected based on high daily volume of wastewater flow after several days of no precipitation.

[2] Selected based on highest daily volume of wastewater flow on or after largest precipitation events.

[3] Based on WWTP - Total System 2,109 REUs in 2010 and estimated service population of 5,272 persons

[4] Based on WWTP - Total System 7,908 persons (conservatively assuming 50% increase in service population during summer tourism season).

City of Charlevoix
Wastewater Treatment Plant
Table 7
Basis of Design

		Existing, 2010 - 2012		Projected, 2033	
		mgd	**gpm**	**mgd**	**gpm**
1. Flow					
a.	Annual Avg Day	0.37	260	0.60	420
b.	Summer Avg Day	0.53	370	0.80	560
c.	Peak Day	0.89	620	2.00	1,400
2. BOD, Influent		**mg/L**	**lb/day**	**mg/L**	**lb/day**
a.	Annual Avg Day	240	740	240	1,200 [1]
b.	Summer Avg Day	280	1,235	280	1,870 [2]
c.	Peak Day	600	2,650	600	10,000 [3]
3. BOD Primary Effluent					
a.	Annual Avg Day	160	495	160	800 [1]
b.	Summer Avg Day	235	1,040	235	1,570 [2]
c.	Peak Day	280	1,240	280	4,670 [3]
4. Influent Ammonia					
a.	Annual Avg Day	31	95	31	155 [1]
b.	Summer Avg Day	35	154	35	232 [2]
c.	Peak Day	40	177	40	667 [3]
5. Influent Temperature		°F			
a.	Minimum	46			
b.	Average	58			
c.	Maximum	72			

		Existing	Proposed 2033
6. Raw Biosolids			
a.	Volume	190,000 gal/mo	300,000 gal/mo
		6,330 gal/day	10,000 gal/day
b.	Total Solids	2.2% = 1,162 lb/day	2.2% = 1,835 lb/day
c.	Volatile Solids	76% = 883 lb/day	76% = 1,395 lb/day
d.	Loading on Primary Digester (22,000 cf)	40 lb/1,000 cf	63 lb/1,000 cf
7. Digested Biosolids			
a.	Volume	1,260 gal/day	2,015 gal/day[1]
b.	Total Solids	3.83%	3.83%
c.	Volatile Solids	58%	58%
d.	Supernatant		
	1) Volume	6,300 gal/mo	10,080 gal/mo
	2) BOD	740 mg/L	740 mg/L
	3) Loading	40 lb/day	70 lb/day

Notes
1. Based on 0.60 mgd
2. Based on 0.80 mgd
3. Based on 2.0 mgd

City of Charlevoix
Wastewater Treatment Plant
Table 8

Basic Plant Improvements

	Plant Unit	Purpose	Cost Estimate
1.	Headworks		
	a. Dual Screens, Finer Mesh	10 States	$200,000
	b. Grit Classifier	Improved Preformance	$60,000
	c. Redundant Meter (Effluent w/ UV)	10 States	$30,000
2.	Primary Settling		
	a. Drain, Repair, Re-coat, Replace Mechanical Eq.	10 States, Routine O&M	$420,000
	b. Revise Piping: 2 Trains, Scum, WAS	Improved Performance	$50,000
	c. FRP Covers	Improved Performance	$240,000
3.	Aeration - See Alternatives		
4.	Final Settling		
	Drain, Repair, Re-Coat, Replace Mechanical Eq. Except Alt. 3	Routine O&M	$400,000
5.	Disinfection		
	Convert to UV	Safety, Improved O&M	$200,000
6.	Sludge Digesters		
	Drain, Repair, Re-Coat Both Tanks	Routine O&M	$300,000
	Replace Transfer Pumps	Improved O&M	$85,000
7.	Sludge Thickening	Improved O&M	$750,000
8.	Sludge Storage 300,000 gal	Improved O&M	$500,000
9.	Admin. Building (2,000 sf) & SCADA	Improved O&M	$1,000,000
10.	BioFilter	Odor Control	$500,000
11.	Site Lift Station Force Main	Improved O&M	$60,000
12.	Mechanical (HVAC)	Improved O&M & Meet Codes	$175,000
13.	Generator	Improved O&M	$150,000
14.	Electrical Improvements	Improved O&M & Meet Codes	$575,000
	Construction Total		$5,695,000

City of Charlevoix
Wastewater Treatment Plant

Table 9
Alternate 1: Optimum Performance of Existing Facilities *

	Plant Unit	Purpose	Cost Estimate
1.	Basic Plant Improvements	Table 8	$5,695,000
	Construction Total		$5,695,000
	Contingency, Legal, Engineering, and Fiscal		$1,708,500
	Project Total		$7,403,500

* May not be able to meet NPDES permit during cold weather.

City of Charlevoix
Wastewater Treatment Plant

Table 10
Alternate 2: Conventional Activated Sludge Upgrade *

Plant Unit	Purpose	Cost Estimate
1. Basic Plant Improvements	Table 8	$5,695,000
2. Additional Aeration Tanks	10 States	$1,000,000
3. Air Systems a. Air diffuser assemblies b. Blowers	10 States	$250,000
4. Piping Systems a. Piping for Influent, Effluent, RAS, WAS, Air b. RAS/WAS Pumps	10 States	$500,000
Construction Total		$7,445,000
Contingency, Legal, Engineering, and Fiscal		$2,200,000
Project Total		$9,645,000

* May not be able to meet NPDES permit during cold weather.

City of Charlevoix
Wastewater Treatment Plant

Table 11
Alternate 3: Advanced Treatment

	Plant Unit	Purpose	Cost Estimate
1.	Basic Plant Improvements	Table 8	$5,695,000
2.	Additional Aeration Tanks	Alternate	$200,000
3.	Complete Advanced Treatment System		$1,650,000
4.	Process Requirements		$350,000
5.	Piping Systems	10 States	$500,000
	Total		$8,395,000
	Contingency, Legal, Engineering, and Fiscal		$2,500,000
	Project Total		$10,895,000

SCALE

0 500 1000 1500 2000 FT.

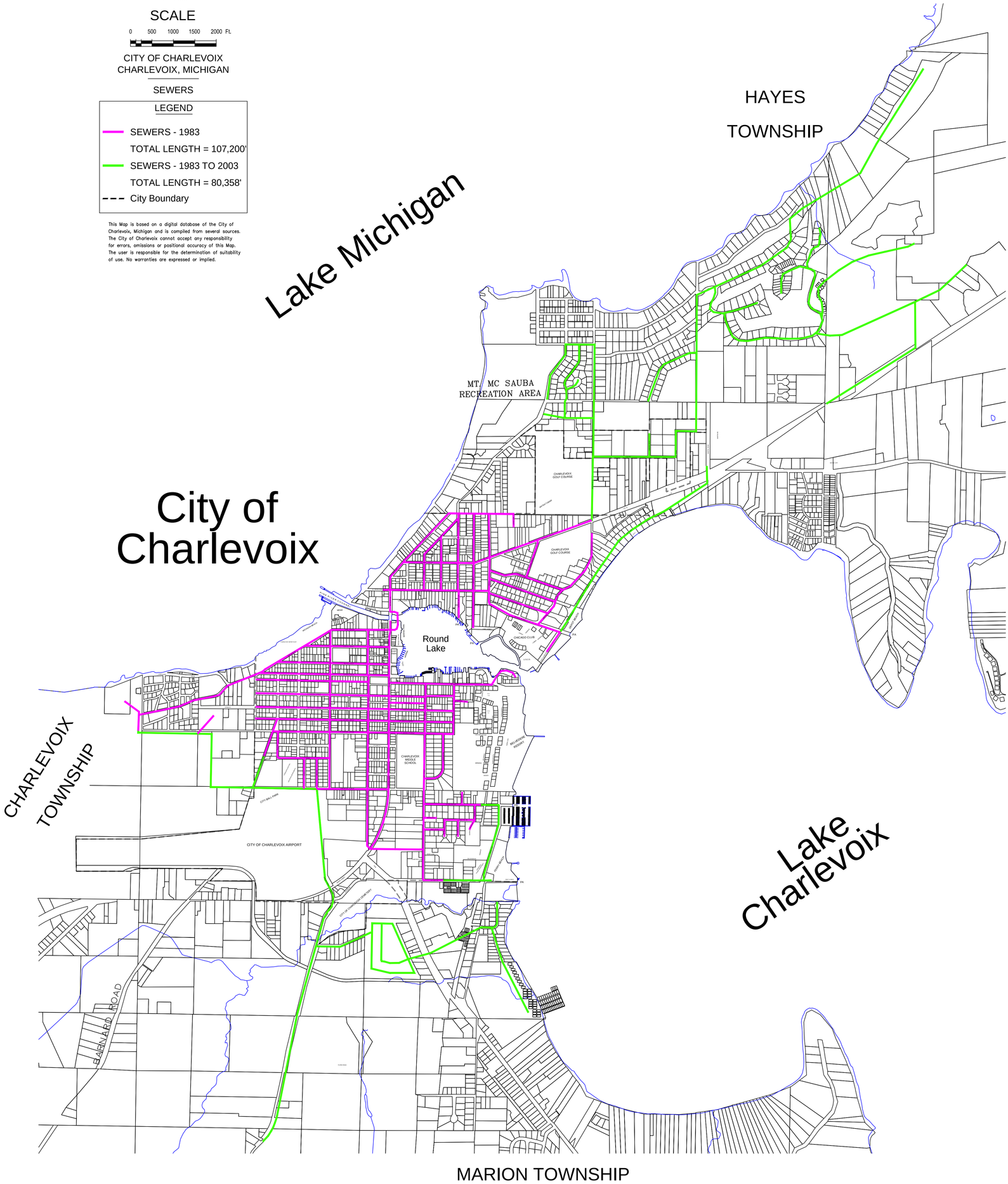
CITY OF CHARLEVOIX
CHARLEVOIX, MICHIGAN

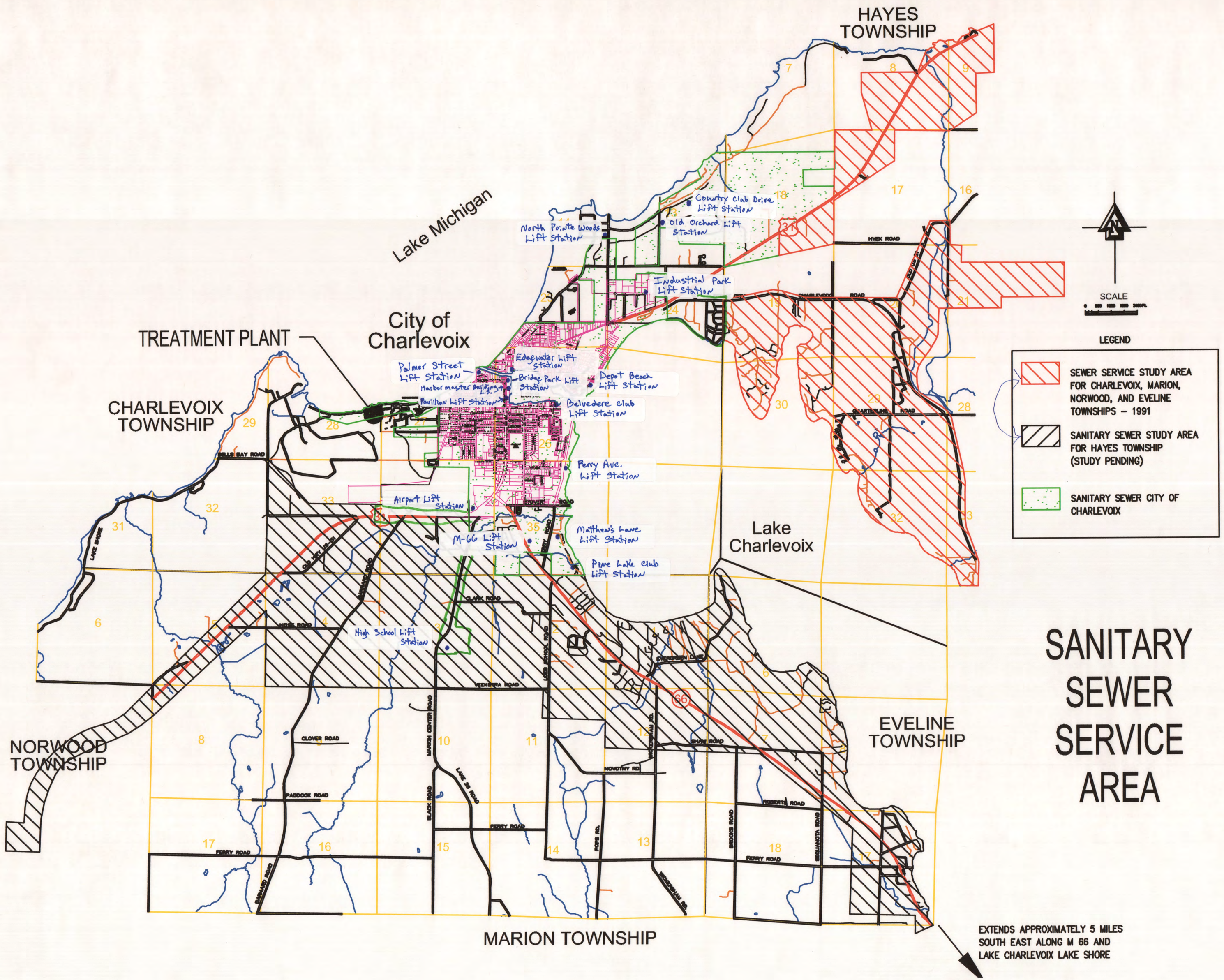
SEWERS

LEGEND

SEWERS - 1983
TOTAL LENGTH = 107,200'
SEWERS - 1983 TO 2003
TOTAL LENGTH = 80,358'
City Boundary

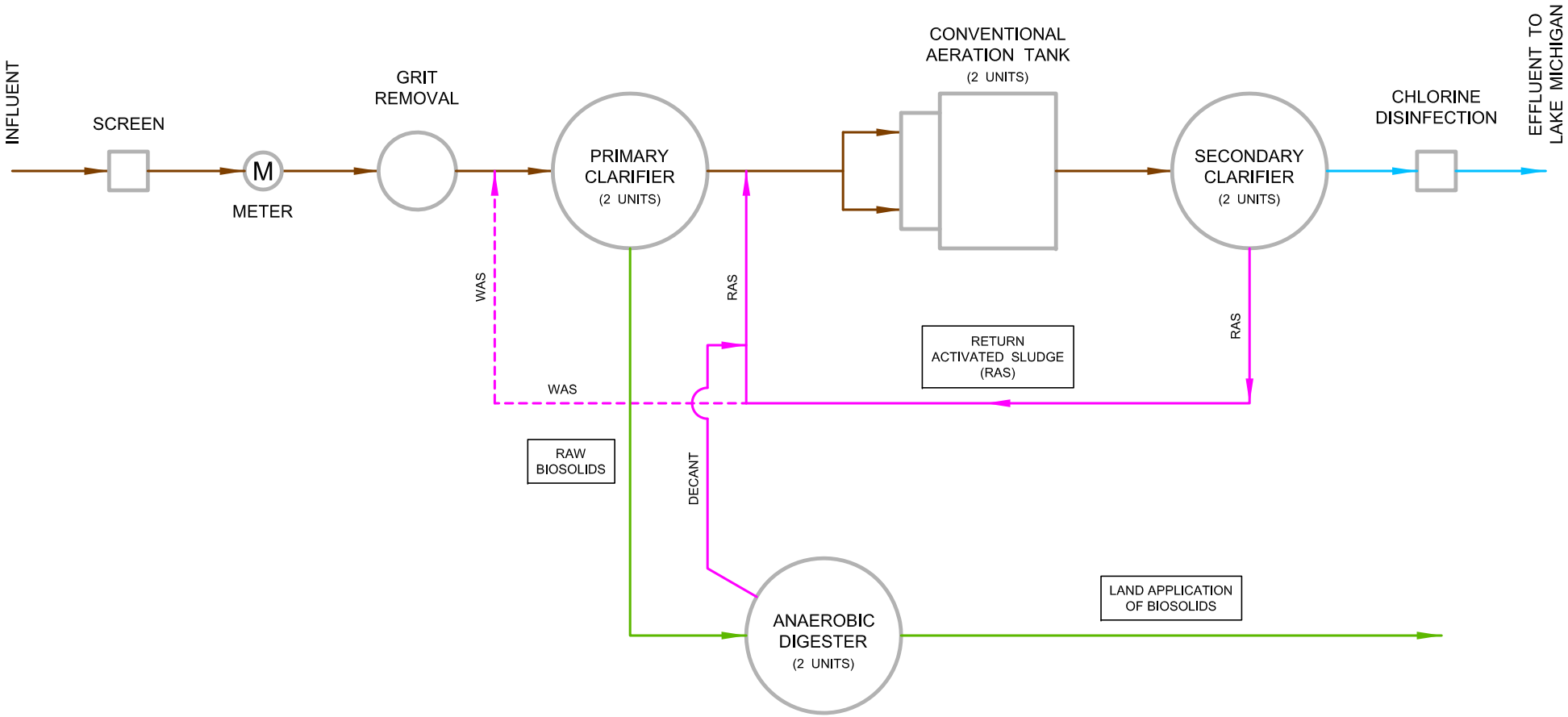
This Map is based on a digital database of the City of Charlevoix, Michigan and is compiled from several sources. The City of Charlevoix cannot accept any responsibility for errors, omissions or positional accuracy of this Map. The user is responsible for the determination of suitability of use. No warranties are expressed or implied.





SANITARY SEWER SERVICE AREA

World • United States • MI • Charlevoix Co.
Lake Shore Dr
Lake Shore Dr
Shore Dr
Spring St
Spring St
Boulder Park
Lakewood Ave
100 feet
25 m
© 2012 Microsoft Corporation
State of Michigan
© 2012 Nokia



LEGEND

- EXISTING PROCESS UNIT
- INFLUENT
- BIOSOLIDS
- RETURN ACTIVATED SLUDGE (RAS)
- WASTE ACTIVATED SLUDGE (WAS)
- EFFLUENT

CITY OF CHARLEVOIX

CHARLEVOIX COUNTY, MICHIGAN

WASTEWATER TREATMENT PLANT

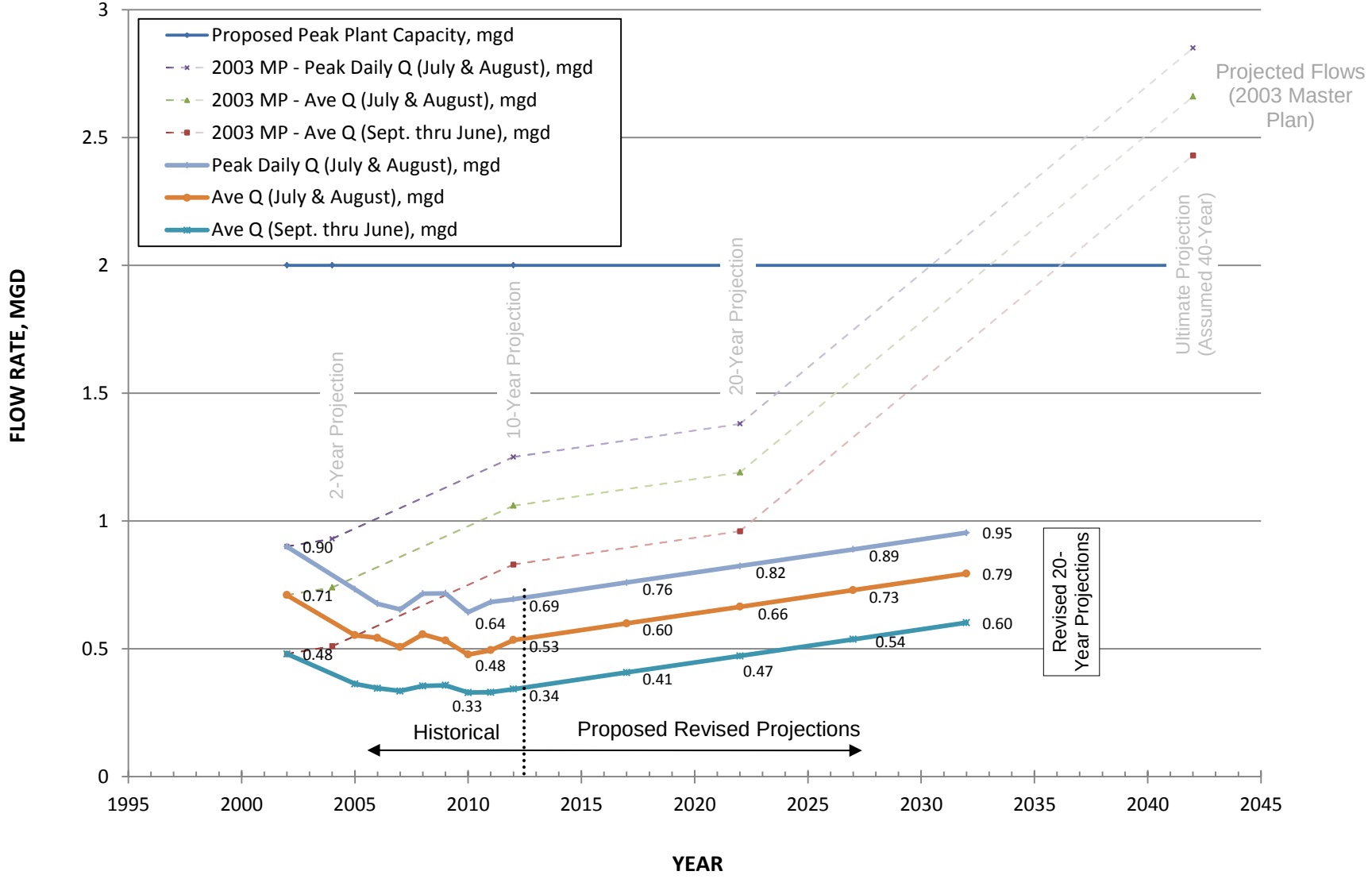
EXISTING PROCESS SCHEMATIC

FIGURE 4

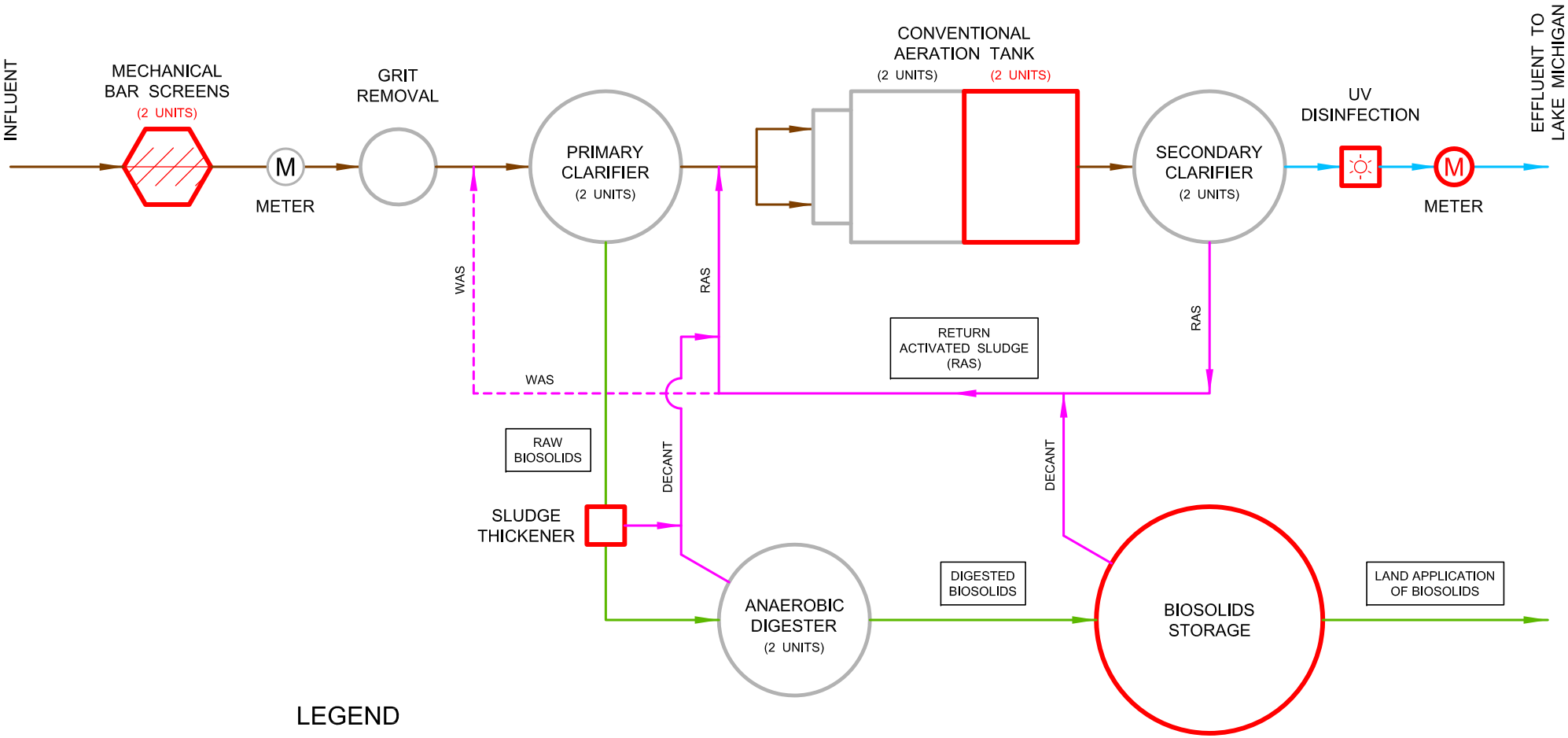
Prein&Newhof

2110372

FIGURE 1
City of Charlevoix - WWTP Evaluation
HISTORICAL AND PROJECTED WWTP FLOWS



Note: Historical flow data through October 2012.



LEGEND

- EXISTING PROCESS UNIT
- NEW PROCESS UNIT
- INFLUENT
- BIOSOLIDS
- RETURN ACTIVATED SLUDGE (RAS)
- WASTE ACTIVATED SLUDGE (WAS)
- EFFLUENT

CITY OF CHARLEVOIX

CHARLEVOIX COUNTY, MICHIGAN

WASTEWATER TREATMENT PLANT

PROCESS SCHEMATIC

ALTERNATE 2
CONVENTIONAL ACTIVATED SLUDGE UPGRADE
FIGURE 6

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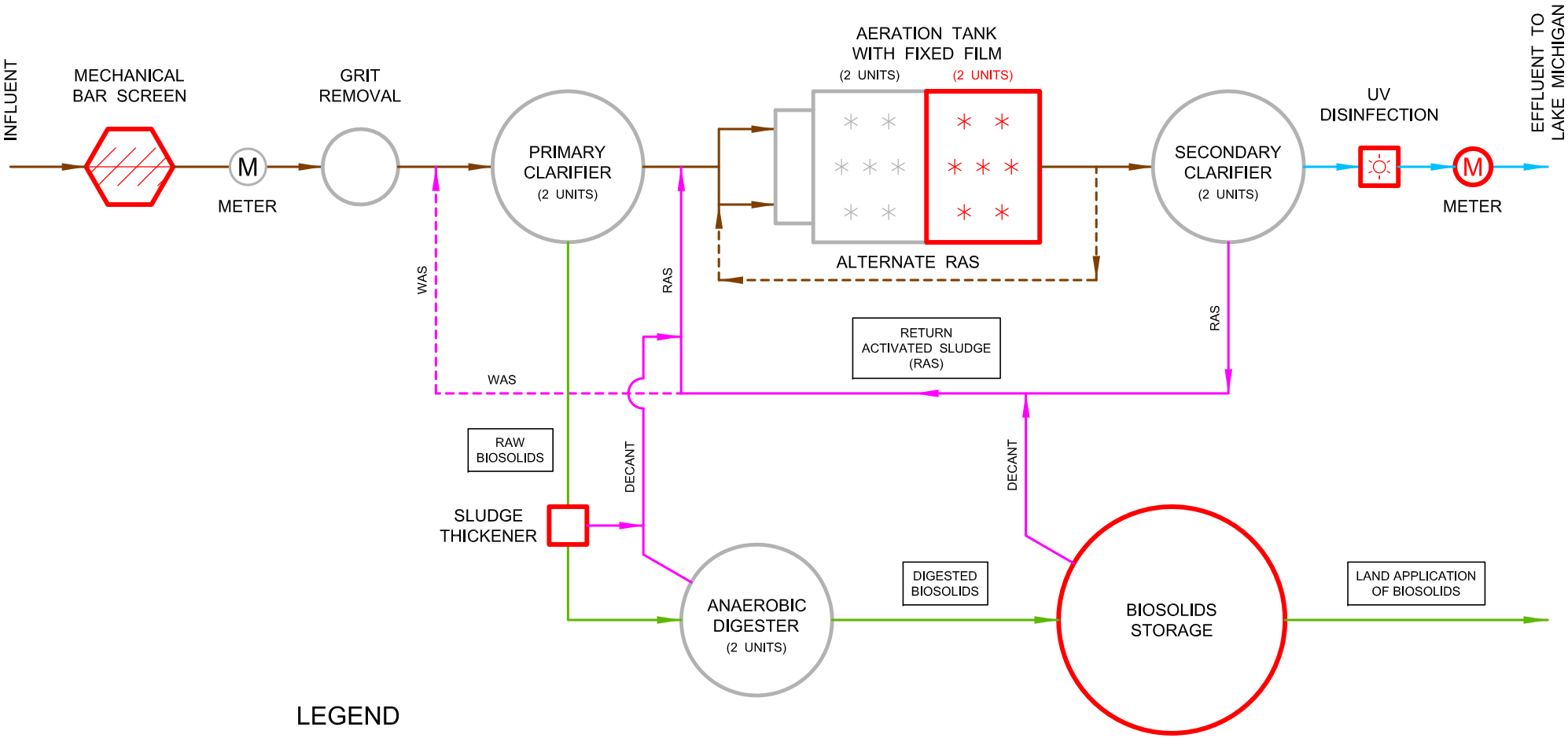

LEGEND

- EXISTING PROCESS UNIT
- NEW PROCESS UNIT
- INFLUENT
- BIOSOLIDS
- RETURN ACTIVATED SLUDGE (RAS)
- WASTE ACTIVATED SLUDGE (WAS)
- EFFLUENT

CITY OF CHARLEVOIX

CHARLEVOIX COUNTY, MICHIGAN

WASTEWATER TREATMENT PLANT

PROCESS SCHEMATIC

ALTERNATE 3 : ADVANCED TREATMENT
ACTIVATED SLUDGE WITH FIXED FILM SURFACES
FIGURE 7

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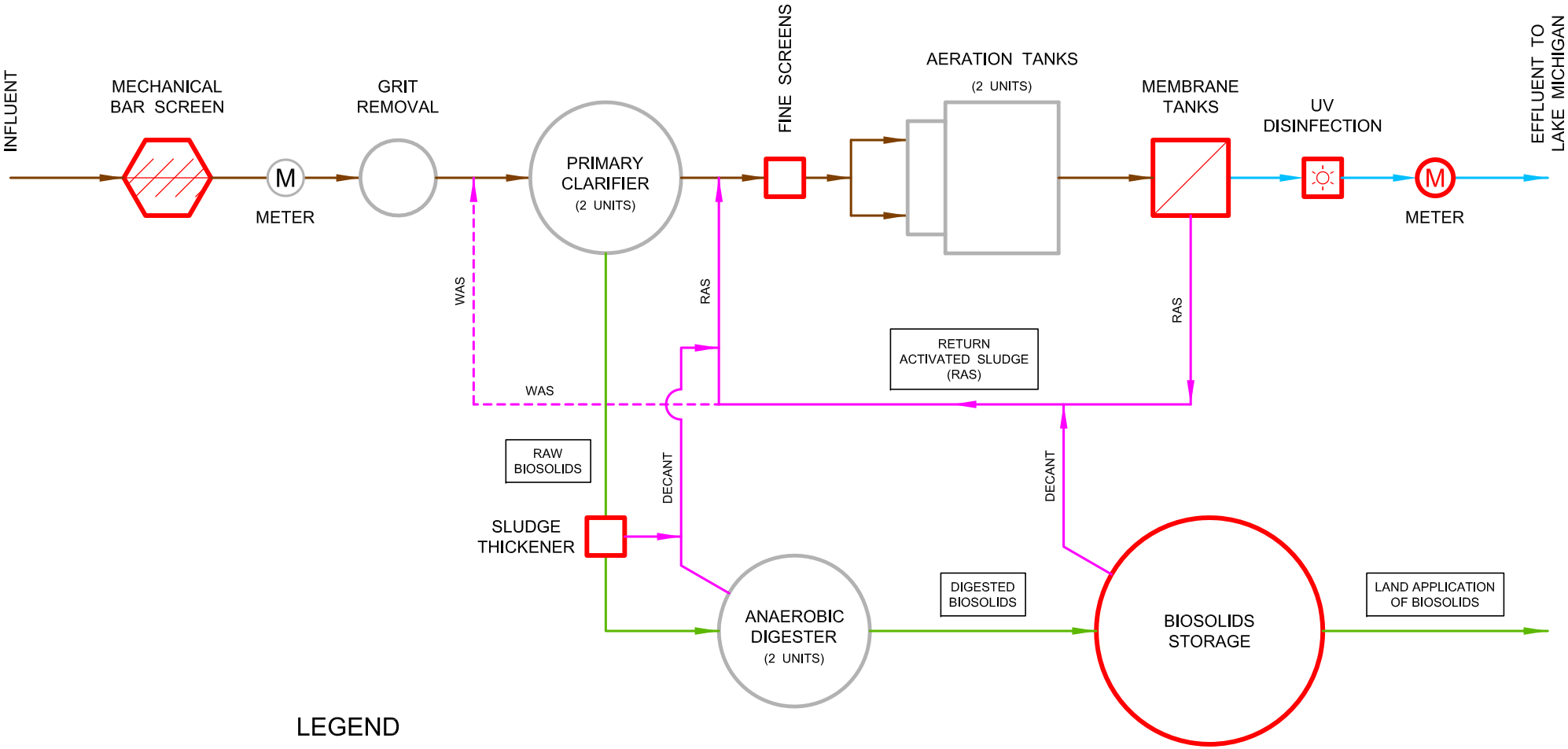

LEGEND

- EXISTING PROCESS UNIT
- NEW PROCESS UNIT
- INFLUENT
- BIOSOLIDS
- RETURN ACTIVATED SLUDGE (RAS)
- WASTE ACTIVATED SLUDGE (WAS)
- EFFLUENT

CITY OF CHARLEVOIX

CHARLEVOIX COUNTY, MICHIGAN

WASTEWATER TREATMENT PLANT

PROCESS SCHEMATIC

ALTERNATE 3 : ADVANCED TREATMENT
ACTIVATED SLUDGE WITH MEMBRANE BIOREACTOR
FIGURE 8

Prein&Newhof

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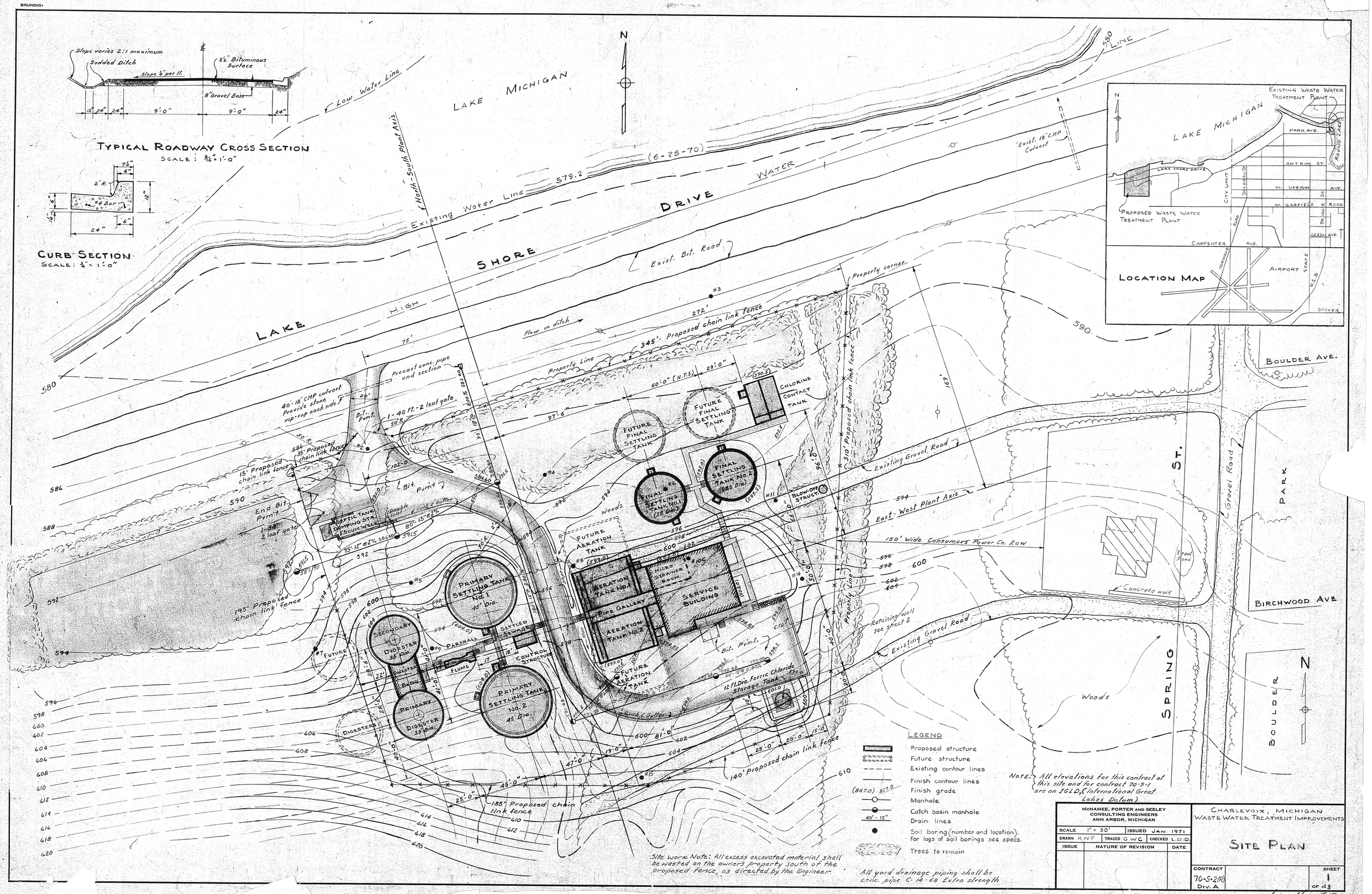
Appendix A

Existing WWTP Site Plan

BRUNING+


Slope varies 2:1 maximum
Sodded Ditch
Slope ¼" per ft.
2½" Bituminous Surface
8" Gravel Base
12" 24" 24" 9'-0" 9'-0" 24"
TYPICAL ROADWAY CROSS SECTION
SCALE: 3/16" = 1'-0"
7½" 6" 2" R. #4 Bar 12" 6" 24"
CURB SECTION
SCALE: ¾" = 1'-0"
N
LAKE MICHIGAN
Low Water Line
580 LINE
(6-25-70)
Existing Water Line 579.2
North-South Plant Axis
LAKE SHORE DRIVE
LAKE HIGH WATER
Exist. Bit. Road
Exist. 18" CMP Culvert
Property corner
Flow in ditch
345' Proposed chain link fence
272'
Property Line
Precast conc. pipe end section
40'-18" CMP culvert
Provide stone rip-rap each side
1-40 Ft.-2 leaf gate
15' Proposed chain link fence
35' Proposed chain link fence
End Bit. Pvmt.
Bit. Pvmt.
SEPTIC TANK DUMPING STA. (SUM. WELL)
195' Proposed chain link fence
SECONDARY DIGESTER 35' Dia.
PRIMARY DIGESTER 35' Dia.
DIGESTERS
PARSHALL FLUME
SETTLED SEWAGE
CONTROL STRUCTURE
PRIMARY SETTLING TANK No. 1 45' Dia.
PRIMARY SETTLING TANK No. 2 45' Dia.
FUTURE AERATION TANK
AERATION TANK No. 1
AERATION TANK No. 2
PIPE GALLERY
MICRO STRAINER ROOM
SERVICE BUILDING
FUTURE FINAL SETTLING TANK
FINAL SETTLING TANK No. 1 (35' Dia.)
FINAL SETTLING TANK No. 2 (45' Dia.)
CHLORINE CONTACT TANK
BLOW-OFF STRUCT.
12 Ft. Dia. Ferric Chloride Storage Tank
Curb & Gutter
Woods
310' Proposed chain link fence
Existing Gravel Road
East-West Plant Axis
150' Wide Consumers Power Co. ROW
Retaining wall see sheet 2
Concrete walk
Trout Pond
140' Proposed chain link fence
185' Proposed chain link fence
BOULDER AVE.
BIRCHWOOD AVE
SPRING ST.
BOULDER PARK
Gravel Road
Woods
LOCATION MAP
EXISTING WASTE WATER TREATMENT PLANT
PROPOSED WASTE WATER TREATMENT PLANT
PARK AVE.
ANTRIM ST.
W. UPRIGHT AVE.
W. GARFIELD ROAD
CITY LIMIT
SALISBURY
BIRCH
3rd
GREEN AVE.
CARPENTER AVE.
NORTHWOOD ROAD
AIRPORT
STATE
M.S.B.
STAVER
LEGEND
Proposed structure
Future structure
Existing contour lines
Finish contour lines
Finish grade
Manhole
Catch basin manhole
Drain lines
Soil boring (number and location). for logs of soil borings see specs.
Trees to remain
Site work Note: All excess excavated material shall be wasted on the owner's property south of the proposed fence, as directed by the Engineer.
All yard drainage piping shall be conc. pipe C-14-68 Extra strength
NOTE: All elevations for this contract at this site and for contract 70-S-1 are on IGLD, (International Great Lakes Datum)
McNAMEE, PORTER AND SEELEY
CONSULTING ENGINEERS
ANN ARBOR, MICHIGAN
SCALE 1" = 30' ISSUED JAN. 1971
DRAWN R.W.F. TRACED G.W.C. CHECKED L.D.D.
ISSUE NATURE OF REVISION DATE
CHARLEVOIX, MICHIGAN
WASTE WATER TREATMENT IMPROVEMENTS
SITE PLAN
CONTRACT 70-S-2(R) DIV. A
SHEET 1 OF 43
6-4-EB

Appendix B

Service Agreements

CITY OF CHA EVOIX – CHARLEVOIX COUNTR LUB, INC.
SEWAGE SYSTEM ADDITION AGREEMENT
(Hayes Township Phase)

This Agreement is between the City of Charlevoix (the "City") and the Charlevoix Country Club, Inc. (the "Country Club").

PREAMBLE

WHEREAS, the City has been authorized by Hayes Township to operate a sewer system within Hayes Township which will serve lands owned by the Country Club; and

WHEREAS, the Country Club's development is benefitted by the presence of a publicly operated sewer system, the City is benefitted by an increase in its customer base;

NOW THEREFORE the parties acting through their legally authorized representatives and in consideration of the mutual promises contained in this Agreement agree as follows:

ARTICLE I
INTRODUCTION

A. **Definitions.**

1. The Country Club may also be called the "Developer".

2. The term "Country Club parcels" shall mean the land described in Exhibit 1. The Country Club parcels may also be called the "Development Area".

3. The "Original Agreement" means the Sewage System Addition Agreement which was executed on or about January 22, 1992 between the City, the Country Club, Charlevoix Township and North Pointe Woods Development Corporation and all amendments thereto.

4. The term "Township" shall mean Hayes Township.

5. "REU" shall mean a residential equivalent unit as defined by Appendix 1 to the Original Agreement, being the Table of Unit Factors passed by the Charlevoix City Council by Resolution 84-7-3, adopted July 16, 1984. The City shall have the right to revise this Table of Unit Factors based upon generally accepted engineering principles and any such revision shall then apply to this Agreement.

6. "Township Parcels" shall mean any land in Hayes Township which is not in the Development Area (i.e. lies outside of the Charlevoix Country Club parcels as described in Exhibit 1).

D. **Original Agreement.** Except as specifically modified by this Agreement, the Original Agreement remains in effect and is incorporated by reference.

ARTICLE II
PROJECT

A. **Developer's Responsibilities.** The Developer shall construct a sewer system to serve its Development Area and which shall be connected to the City's sewer system at a location to be determined by the City. The construction of the sewer system and all connections to the City's system shall be done at the Developer's expense. The Developer shall pay for project costs of the City as required by this Agreement. In addition to project costs, the Developer shall reimburse the City for all reasonable expenses incurred by the City and the review of preliminary reports, design reports and inspection of the project. The Developer shall obtain City approval of all plans and specifications for the proposed sewer system and any changes to the plans and specifications which are proposed during construction. Plans and specifications shall be submitted to the City in accord with the requirements of Appendix 5 to the Original Agreement. No construction shall begin until the City has approved the plans and specifications. A DEQ construction permit must be obtained, the City must be given a copy of an insurance policy which contains the terms required below and the Township must be given seventy-two (72) hours notice prior to the planned start of construction. The Developer shall pay all costs incurred by the City, including professional (such as legal) or engineering fees relating to this project which includes, but is not limited to, the City's review of plans, specifications and any inspection during and after construction of the sewer system, and the drafting of all documents by the city attorney which relate to this project. The Developer shall provide a policy of insurance which names the City and Township as co-insured in amounts not less than those required in Appendix 7 to the Original Agreement. The insurance policy shall be in effect until ownership of the Developer's system is transferred to the City pursuant to the terms of this Agreement. The forgoing requirements shall be in addition to those described elsewhere in this Agreement. Nothing in this Agreement shall alter the Developer's responsibility to comply with all Township zoning requirements.

B. **City's Rights and Responsibilities.** The City agrees to accept into the City sewer system up to a combined total of 260 REUs from Hayes Township and the Development Area (as described in the Original Agreement) in Charlevoix Township. The City shall have the right to review and approve or disapprove all engineering plans for the Developer's proposed sewer system and to have its consultants inspect construction to ensure that it complies with the approved plans. The City shall have the right to require the use of specific types of materials, construction or components when such materials, construction or components result in longer life or where the improvements require a low operation or maintenance cost for said improvements. The City shall have the right to inspect on-site all construction in progress. The City's representatives shall have direct access to the Developer's engineers and shall be provided a copy of all engineering reports. No portion of the system shall be placed into operation and no tap-ins will be permitted until the City, through its engineers,

determines that th ystem meets the approved plans a specifications, they are the same as formally accepted in writing by the City, the Developer has provided the City with the required maintenance and guarantee bonds and all engineering, consultant and attorney fees incurred by the City have been paid by the Developer. The Developer shall make any changes in construction or to construction plans requested by the City. The City shall apply, on behalf of the Developer, for any DEQ permits required for the Developer's sewer system only after it has approved the construction plans. The City shall have the right to hire engineers or other consultants so that it may exercise its rights under this Agreement and all such costs shall be paid by the Developer. All discretionary decisions permitted by the City in this Agreement shall be made within a reasonable time period unless a specific time period is required and shall be exercised reasonably or in accordance with generally accepted professional practices, e.g., if any engineering decision is required, then it shall be made consistent with generally accepted engineering practices.

C. **Connection.** The City is not obligated to accept connection of the Developer's system to the City's collection system until (a) it is satisfied that the Developer's system has been constructed according to plans previously approved by the City or its consultants and has accepted the system in writing and (b) the Developer is not in breach of any of its obligations under this Agreement which includes, but is not limited to, the Developer providing the City with a one (1) year maintenance and guarantee bond. The location of a connection of the Developer's system to the collection system shall be at a location determined by the City.

D. **Ownership.** The City shall become the owner of the Developer's sewer system once the City notifies the Developer in writing that the Developer's system has been constructed according to plans and specifications previously approved by the City, that the City accepts the system under the procedure outlined below, that it has received the one (1) year maintenance and guarantee bond as required by this Agreement, that any engineering fees and consultant fees incurred by the City have been paid and that the Developer is not in breach of any of its other obligations under this Agreement. The Developer will specify in writing when it believes that the sewer system which it is constructing is complete. The City shall have fourteen (14) days to decide whether the system is in fact complete and has been constructed in accordance with plans and specifications previously approved by the City. The City shall notify the Developer of its decision in writing. The City shall accept ownership of the sewer system once it is satisfied that the system is complete and has been built in accordance with previously approved plans and specifications, provided that the City in its sole discretion has the right to determine whether a portion of the sewer system rather than the entire system will be accepted for City ownership. Nothing in this Agreement shall prohibit the City from charging monthly fees for sewer services to any parcel connected to any sewer or collection system owned by the City. In addition, the City shall not be obligated to accept the sewer system and there shall be no tap-ins or connections to the sewer system until "as built" plans have been filed with the City and the City or its representatives have conducted such tests as they deem appropriate and these tests show that there is no outside infiltration (such as ground water) into the

sewer system. Th City shall the right to confirm the a racy of "as built" plans and all test results. The Developer shall pay for costs of all tests.

ARTICLE III
FEES

A. **Collection System Fee.** A collection system fee of Two Thousand and 00/100 ($2,000.00) Dollars per REU shall be collected by the City for all Township parcels which tap into any part of the City's sewer system regardless of whether it is an existing sewer system, a system built by the Developer, the collection system or any future sewer system. All such fees collected pursuant to this provision shall be placed in the construction fund.

B. **Construction Fee.** The City shall impose and collect a construction fee for all parcels which (1) are described in Exhibit 2, or (2) abut the Country Club parcels and also require an easement from the Country Club to access the Developer's sewer system. The construction fee shall be One Thousand Five Hundred and 00/100 ($1,500.00) Dollars per REU. Constructions fees shall be placed in the construction fund.

C. **Privilege Fee.** The City has the right to impose and collect a privilege fee for those parcels connecting to the Developer's sewer system. These fees are currently One Thousand Five Hundred and 00/100 ($1,500.00) Dollars for parcels outside the City. The City shall have the right to modify these fees as it deems advisable. Privilege fees shall not be placed in the construction fund, but rather they may be used by the City as it sees fit.

ARTICLE IV
CONSTRUCTION FUND

As it pertains to the Country Club, Article IV of the Original Agreement is incorporated herein by reference.

ARTICLE V
LETTER OF CREDIT

As it pertains to the Country Club, Article V of the Original Agreement is incorporated herein by reference.

ARTICLE VI
TAPS

As it pertains to the Country Club, Article VI of the Original Agreement is incorporated herein by reference.

ARTICLE VII
MISCELLANEOUS

Article VIII of the Original Agreement is incorporated herein by reference except that the term "Township" shall mean Hayes Township.

IN WITNESS of this Agr ent the parties by their authorize presentatives have executed this document on the date set forth below.

Date: October 24, 1996

CITY OF CHARLEVOIX

By: Josh Barnes

Josh Barnes

Its: Mayor

By: Jo Anne Patrick

Jo Anne Patrick

Its: Clerk

Date: _____

CHARLEVOIX COUNTRY CLUB, INC.

By: _____

Richard Lobenherz

Its: President

By: Richard A. Shapack

Richard A. Shapack

Its: Secretary

EXHIBIT 1

CHARLEVOIX COUNTRY CLUB PROPERTY LOCATED IN HAYES TOWNSHIP.

PART OF SECTION 18, TOWNSHIP 34 NORTH, RANGE 7 WEST, HAYES TOWNSHIP, CHARLEVOIX COUNTY, MICHIGAN, DESCRIBED AS: COMMENCING AT A 1/2" IRON ROD AT THE WEST QUARTER CORNER OF SAID SECTION 18; THENCE SOUTH 0°06'27" EAST ON THE WEST LINE OF SAID SECTION 18, A DISTANCE OF 977.30 FEET; THENCE NORTH 89°53'33" EAST 330.00 FEET; THENCE SOUTH 0°06'27" EAST 1467.80 FEET TO THE CENTERLINE OF HIGHWAY U.S.-31; THENCE NORTH 57°19'12" EAST ON SAID HIGHWAY CENTERLINE 5287.94 FEET; THENCE NORTHEASTERLY ON SAID HIGHWAY CENTERLINE 306.52 FEET AROUND A 5854.57 FOOT RADIUS CURVE TO THE LEFT WHOSE CHORD BEARS NORTH 55°45'09" EAST 306.48 FEET TO THE EAST LINE OF SAID SECTION 18; THENCE NORTH 0°09'28" WEST ON SAID EAST LINE 543.40 FEET TO THE EAST QUARTER CORNER OF SAID SECTION 18; THENCE NORTH 0°22'19" WEST ON SAID EAST SECTION LINE 2288.02 FEET (REC. AS NORTH 2309 FEET) TO A POINT THAT IS 338.00 FEET SOUTH OF THE NORTHEAST CORNER OF SAID SECTION 18; THENCE SOUTH 77°27'51" WEST PARALLEL WITH THE NORTH LINE OF SAID SECTION 18, A

DISTANCE OF 2554.38 FEET (REC. AS SOUTH 77°32'49" WEST 2544 FEET) TO THE NORTH AND SOUTH QUARTER LINE OF SAID SECTION 18; THENCE NORTH 0°02'18" WEST ON SAID QUARTER LINE 338.00 FEET TO THE NORTH QUARTER CORNER OF SAID SECTION 18; THENCE SOUTH 77°32'49" WEST ON THE NORTH LINE OF SAID SECTION 18, A DISTANCE OF 683.04 FEET; THENCE SOUTH 41°02'33" WEST 2264.72 FEET; THENCE SOUTH 52°36'09" WEST 471.85 FEET TO THE WEST LINE OF SAID SECTION 18; THENCE SOUTH 0°00'31" EAST 1056.18 FEET TO THE POINT OF BEGINNING.

EXCEPTING FROM THE ABOVE DESCRIBED PROPERTY:

("POOL PARCEL")
COMMENCING AT THE SOUTHWEST CORNER OF SECTION 18, TOWNSHIP 34 NORTH, RANGE 7 WEST; THENCE ON THE WEST LINE OF SAID SECTION NORTH 0°06'27" WEST 96.95 FEET TO THE NORTHWESTERLY LINE OF HIGHWAY U.S.-31; THENCE ON SAID HIGHWAY LINE NORTH 57°19'12" EAST 391.59 FEET, BEING THE POINT OF BEGINNING OF THIS DESCRIPTION; THENCE NORTH 0°06'27" WEST 576.67 FEET ON THE EAST LINE OF THE JAMES FIEDLER PROPERTY; THENCE NORTH 89°53'33" EAST 280.00 FEET; THENCE SOUTH 0°06'27" EAST 397.80 FEET TO SAID HIGHWAY LINE; THENCE CONTINUING SOUTH 0°06'27" EAST 148.33 FEET TO THE CENTERLINE OF SAID HIGHWAY; THENCE SOUTH 57°19'12" WEST ON SAID CENTERLINE 332.26 FEET; THENCE LEAVING SAID HIGHWAY NORTH 0°06'27" WEST 148.33 FEET TO THE POINT OF BEGINNING; BEING A PART OF THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 18, TOWNSHIP 34 NORTH, RANGE 7 WEST.

SUBJECT TO ANY AND ALL EASEMENTS AND RESTRICTIONS OF RECORD OR OTHERWISE.

SUBJECT TO THE RIGHTS OF THE PUBLIC AND OF ANY GOVERNMENTAL UNIT IN ANY PART THEREOF, TAKEN, USED OR DEEDED FOR STREET, ROAD OR HIGHWAY PURPOSES.

PREPARED BY: ARTHUR R. RANGER, P.S. 31601

Charlevoix Township
Section 12 & 13

004-013-001-45	Jon Michael & Mary Richards 655 Spring Valley Rd. Ann Arbor, MI 48105
004-013-023-10	Robert & Suzan Bishop 17500 Fairway Livonia, MI 48152
004-013-023-00	Lynn & Janice Evans 750 Tennyson Downs Bloomfield Hills, MI 48304
004-013-002-10	Ivan & Lucille Witthoeft 09298 Old Orchard Rd. Charlevoix, MI 49720
004-013-006-00	Gregory & Betty Martin 12347 Waller Rd. Charlevoix, MI 49720
004-013-005-10	Shannon Lee & Angela Reynolds 12299 Waller Rd. Charlevoix, MI 49720
004-013-007-00	Donald Reynolds & wife 2727 Lake Grove Rd. Petoskey, MI 49770
004-013-008-00	Bruce Shanahan 12023 De Tars Ct. Charlevoix, MI 49720
004-013-112-001-20	Lonny Zietz 1111 Cramton NE. Ada, MI 49301

Hayes Township
Section 7

007-107-002-10	Bruce Shanahan 12023 De Tars Ct
007-107-002-20	Robert Hansen 2213 Briarhill Ct. Naperville, IL 60565
007-107-002-50	Robert Shanahan Trustee 5945 Barkwood Ln. Sylvania, OH 43560
007-107-002-40	ATT-LLL. Jeff Trauben 4133 Pioneer Dr. Walled Lake, MI 48390
007-118-005-10	Robert Shanahan Trustee 5945 Barkwood Ln. Sylvania, OH 43560
007-107-002-30	Avern Cohn Suite 703 206 E. Grand River Detroit, MI 48226
007-118-001-20	Michael & Ramona Bergeon P.O. Box 331 11935 Pa Ba Shan Trail Charlevoix, MI 49720
007-118-001-25	Michael & Ramona Bergeon 655 North 5th Ave. Ann Arbor, MI 48104-1020
007-118-001-15	Lonny & Sandra Zietz 1111 Cramton NE Ada, MI 49301
007-118-001-30	Lonny Zietz 1111 Crmton Ave. Ada, MI 49301

007-118-001-55	Charlevoix Friends of the Pool 110 Park Charlevoix, MI 49720
007-117-004-00	Robert Shanahan 5945 Barkwood Sylvania, OH 43560
007-118-003-00	James Fiedler 12800 Pa Ba Shan Charlevoix, MI 49720

HAYES TOWNSHIP - CITY OF CHARLEVOIX
INTERGOVERNMENTAL AGREEMENT REGARDING SEWER SYSTEM

This Agreement is between the City of Charlevoix (the "City") and Hayes Township (the "Township").

PREAMBLE

WHEREAS, the City and Township are authorized to separately purchase, acquire, construct and improve sewage systems, to operate and maintain the same within and without their respective corporate or jurisdictional limits; and

WHEREAS, the City and Township are empowered to exercise jointly, any power, privilege or authority which they share in common, and which might be exercised separately; and

WHEREAS, the Charlevoix Country Club, Inc. (the "Country Club") and A.T.T.-L.L.C. which is constructing a development generally known as Country Club Shores (the "Shores Development") (the Country Club and Shores Development shall be collectively called the "Developers") are constructing extensions to the City's sewer system at their own expense and the City needs Township permission to operate a City sewer system within the Township; and

WHEREAS, the Township is permitting the limited extension of the City's sewer system into the Township to serve these residential developments which are essentially extensions of developments which were started in adjoining jurisdictions; and

WHEREAS, it is the Township's intent to preserve its rural character and to restrict the extension of the City sewer system to only those lands as specified in this Agreement;

NOW THEREFORE the parties acting through their legally authorized representatives and in consideration of the mutual promises contained in this Agreement agree as follows:

ARTICLE I
INTRODUCTION

A. **Definitions.**

1. The "Country Club parcels" shall mean the land described in Exhibit 1.

2. The "Shores Development parcels" shall mean the land described in Exhibit 2 (which includes Phase I and Phase II).

3. The term "sewer system" shall mean the sewer system which will be constructed by the Developers on their respective parcels pursuant to plans which have been approved by the City.

ARTICLE II
TOWNSHIP RESPONSIBILITIES

A. **Sewer Ordinance.** The Township shall enact and enforce a sewer ordinance as requested by the City and such ordinance shall be essentially similar to the City's sewer ordinance. If requested by the City, the Township shall permit the placing of unpaid sewer charges on property taxes. The Township hereby appoints the City to be its agent for enforcement and administration of the Township sewer ordinance. In its sole discretion the City may take any action regarding the enforcement or

administration of the sewer ordinance which the Township could take. Whenever the City acts as the Township's agent, the Township is relieved from its responsibility under this Agreement to take such action. The Township shall also amend the sewer ordinance which has been enacted pursuant to this provision so that it is consistent with any subsequent amendments made by the City to the City's sewer ordinance.

B. **Administration/Operation.** The Township authorizes the City to administer and operate the sewer system within the Country Club parcels and the Shores Development parcels, and to make such connections between the sewer system and the City's preexisting sewer system as the City deems appropriate. This includes the authority to use public rights-of-way within the Township. The City shall have the right to bill sewer customers in the Township directly for charges for sewer services or other related charges, to accept payment directly from the customer and to discontinue sewer service if sewer charges are unpaid.

C. **Miscellaneous Actions.** The Township shall enact such other ordinances or execute such other contracts or documents as are required by the City and which are necessary for the City to operate the sewer system lawfully, to operate the sewer system in an effective manner or to ensure that the City may exercise all remedies available to it as an owner of the sewer system. However, no such ordinance amendment or contract shall require or permit lands to connect to the sewer system which are outside of the Country Club parcels and the Shores Development parcels. The Township shall also enter into a contract with Charlevoix Township which requires Charlevoix Township to terminate its water service to sewer customers within Hayes Township who fail to make required payments for sewer service and which requires each township to enact such ordinances as are legally required to provide for the termination of such water services.

ARTICLE III
CITY RESPONSIBILITIES

A. **Administration/Operation.** This City shall administer and operate at its own expense all matters relating to the administration and operation of the sewer system. By way of example and not limitation, this includes handling applications for tap-ins, billing, collection and dealing directly with sewer system users.

B. **Maintenance.** The City at its own expense shall be responsible for maintenance and repair of the sewer system.

C. **Liability.** The City assumes all liability relating to the sewer system and shall indemnify and hold harmless the Township from any such liability.

D. **Sewer System Acceptance.** The City shall only accept the sewer system and permit its operation after the City is satisfied that the Developers have or will comply with all requirements contained in the applicable contracts between the City and each Developer. The City is obligated to assume its responsibilities under this Agreement only after it accepts the sewer system. Upon acceptance of the sewer system the City shall be the owner of the sewer system.

E. **Expenses.** The City shall pay all expenses relating to the sewer system and shall pay all attorney fees relating to the implementation of the Township's responsibilities under this Agreement. The City may designate the Charlevoix city attorney to perform all legal services which are required by this Agreement.

F. **Rates.** The monthly service charge, commodity charge, terminated service turn-on fee or any other fee or charge relating to sewer services for Township parcels shall be 1.5 times the fees or charges for City residents. The City may change any of its fees or charges, except the 1.5 multiplier, at any time without notice. This provision shall not be construed as limiting the City's right to set different multipliers for non-Township parcels. As part of the consideration for this Agreement, the parties to this Agreement agree to waive any right they may now or hereafter have to challenge the reasonableness, legality or fairness of the City's rates or the multiplier. It is acknowledged that the law regarding multiplier rates and charges to non-City residents may now or in the future require cost justified rate multipliers. The parties waive any such requirements and agree that the City shall bear no burden to justify the 1.5 multiplier on a cost basis. The City may send bills for its rates for sewer or other charges directly to customers and may accept payments directly from the customers.

This Agreement has been approved by the governing body of each party and has been executed by a duly authorized representative. This Agreement shall become effective when it has been signed by the last of the parties.

Date: 9/24/96

CITY OF CHARLEVOIX

By: Josh Barnes
Josh Barnes

Its: Mayor

By: Jo Anne Patrick
Jo Anne Patrick

Its: Clerk

Date: 9-19-96

HAYES TOWNSHIP

By: A. Paul Hoadley
A. Paul Hoadley

Its: Supervisor

By: Ethel R Knepp
Ethel Knepp

Its: Clerk

CHARLEVOIX COUNTRY CLUB PROPERTY LOCATED IN HAYES TOWNSHIP.

PART OF SECTION 18, TOWNSHIP 34 NORTH, RANGE 7 WEST, HAYES TOWNSHIP, CHARLEVOIX COUNTY, MICHIGAN, DESCRIBED AS: COMMENCING AT A 1/2" IRON ROD AT THE WEST QUARTER CORNER OF SAID SECTION 18; THENCE SOUTH 0°06'27" EAST ON THE WEST LINE OF SAID SECTION 18, A DISTANCE OF 977.30 FEET; THENCE NORTH 89°53'33" EAST 330.00 FEET; THENCE SOUTH 0°06'27" EAST 1467.80 FEET TO THE CENTERLINE OF HIGHWAY U.S.-31; THENCE NORTH 57°19'12" EAST ON SAID HIGHWAY CENTERLINE 5287.94 FEET; THENCE NORTHEASTERLY ON SAID HIGHWAY CENTERLINE 306.52 FEET AROUND A 5854.57 FOOT RADIUS CURVE TO THE LEFT WHOSE CHORD BEARS NORTH 55°45'09" EAST 306.48 FEET TO THE EAST LINE OF SAID SECTION 18; THENCE NORTH 0°09'28" WEST ON SAID EAST LINE 543.40 FEET TO THE EAST QUARTER CORNER OF SAID SECTION 18; THENCE NORTH 0°22'19" WEST ON SAID EAST SECTION LINE 2288.02 FEET (REC. AS NORTH 2309 FEET) TO A POINT THAT IS 338.00 FEET SOUTH OF THE NORTHEAST CORNER OF SAID SECTION 18; THENCE SOUTH 77°27'51" WEST PARALLEL WITH THE NORTH LINE OF SAID SECTION 18, A

DISTANCE OF 2554.38 FEET (REC. AS SOUTH 77°32'49" WEST 2544 FEET) TO THE NORTH AND SOUTH QUARTER LINE OF SAID SECTION 18; THENCE NORTH 0°02'18" WEST ON SAID QUARTER LINE 338.00 FEET TO THE NORTH QUARTER CORNER OF SAID SECTION 18; THENCE SOUTH 77°32'49" WEST ON THE NORTH LINE OF SAID SECTION 18, A DISTANCE OF 683.04 FEET; THENCE SOUTH 41°02'33" WEST 2264.72 FEET; THENCE SOUTH 52°36'09" WEST 471.85 FEET TO THE WEST LINE OF SAID SECTION 18; THENCE SOUTH 0°00'31" EAST 1056.18 FEET TO THE POINT OF BEGINNING.

EXCEPTING FROM THE ABOVE DESCRIBED PROPERTY:

("POOL PARCEL")
COMMENCING AT THE SOUTHWEST CORNER OF SECTION 18, TOWNSHIP 34 NORTH, RANGE 7 WEST; THENCE ON THE WEST LINE OF SAID SECTION NORTH 0°06'27" WEST 96.95 FEET TO THE NORTHWESTERLY LINE OF HIGHWAY U.S.-31; THENCE ON SAID HIGHWAY LINE NORTH 57°19'12" EAST 391.59 FEET, BEING THE POINT OF BEGINNING OF THIS DESCRIPTION; THENCE NORTH 0°06'27" WEST 576.67 FEET ON THE EAST LINE OF THE JAMES FIEDLER PROPERTY; THENCE NORTH 89°53'33" EAST 280.00 FEET; THENCE SOUTH 0°06'27" EAST 397.80 FEET TO SAID HIGHWAY LINE; THENCE CONTINUING SOUTH 0°06'27" EAST 148.33 FEET TO THE CENTERLINE OF SAID HIGHWAY; THENCE SOUTH 57°19'12" WEST ON SAID CENTERLINE 332.26 FEET; THENCE LEAVING SAID HIGHWAY NORTH 0°06'27" WEST 148.33 FEET TO THE POINT OF BEGINNING; BEING A PART OF THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 18, TOWNSHIP 34 NORTH, RANGE 7 WEST.

SUBJECT TO ANY AND ALL EASEMENTS AND RESTRICTIONS OF RECORD OR OTHERWISE.

SUBJECT TO THE RIGHTS OF THE PUBLIC AND OF ANY GOVERNMENTAL UNIT IN ANY PART THEREOF, TAKEN, USED OR DEEDED FOR STREET, ROAD OR HIGHWAY PURPOSES.

PREPARED BY: ARTHUR R. RANGER, P.S. 31601

Charlevoix Abstract & Engineering Co.

ABSTRACTS of TITLE
TITLE INSURANCE
SURVEYING
ENGINEERING

Women's Business Enterprise [WBE]

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FAX 616 547-0041

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49720

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6738 GREENVIEW
DETROIT, MI 48228
(313) 271-0466
FAX (313) 271-7002

Charlevoix Country Club
PHASE I
UNITS 1 THROUGH 11
July 13, 1996
Job No. 13318c.SB

IN THE TOWNSHIP OF HAYES, CHARLEVOIX COUNTY, MICHIGAN; COMMENCING AT A 1-1/4 INCH PIPE AT THE SOUTHWEST CORNER OF SECTION 7, TOWNSHIP 34 NORTH, RANGE 7 WEST; THENCE ALONG THE SOUTH LINE OF SAID SECTION NORTH 76°42'45" EAST (RECORDED AS NORTH 77°32'49" EAST) 1906.90 FEET TO A T-IRON STAKE ON THE SOUTHEASTERLY LINE OF SHELDON COHN PROPERTY AS DESCRIBED IN LIBER 328, PAGE 27, CHARLEVOIX COUNTY RECORDS; THENCE ALONG THE SOUTHEASTERLY LINE OF SAID COHN PROPERTY NORTH 40°13'26" EAST 94.75 FEET (RECORDED AS NORTH 41°02'35" EAST 95.77 FEET) TO A T-IRON STAKE; THENCE ALONG THE NORTHEASTERLY LINE OF SAID COHN PROPERTY NORTH 58°46'34" WEST (RECORDED AS NORTH 58°01'56" WEST) 665.24 FEET, BEING THE POINT OF BEGINNING OF THIS DESCRIPTION;

THENCE CONTINUING NORTH 58°46'34" WEST (RECORDED AS NORTH 58°01'56" WEST) 790.20 TO THE SHORE OF LAKE MICHIGAN; THENCE ALONG SAID SHORE THE FOLLOWING 6 COURSES: NORTH 37°57'27" EAST 365.76 FEET, NORTH 31°47'09" EAST 395.05 FEET, NORTH 39°16'25" EAST 234.26 FEET, NORTH 21°19'48" EAST 439.44 FEET, NORTH 39°16'01" EAST 243.67 FEET, AND NORTH 53°27'32" EAST 296.15 FEET TO THE SOUTHERLY LINE OF THE ROBERT L. HANSEN PROPERTY AS DESCRIBED IN LIBER 320, PAGE 98, CHARLEVOIX COUNTY RECORDS; THENCE ALONG THE SOUTHERLY LINE OF SAID HANSEN PROPERTY SOUTH 84°30'10" EAST 984.26 FEET TO THE EASTERLY LINE OF PA-BE-SHAN LANE, A 66 FOOT PRIVATE INGRESS, EGRESS AND UTILITIES EASEMENT, AS RECORDED IN LIBER 261, PAGE 209, CHARLEVOIX COUNTY RECORDS, THENCE ALONG SAID EASTERLY EASEMENT LINE THE FOLLOWING SIX COURSES: SOUTH 53°44'34" WEST 42.84 FEET, THENCE SOUTH 26°05'01" WEST 687.20 FEET, THENCE SOUTH 37°32'31" WEST 615.00 FEET, THENCE SOUTH 42°01'31" WEST 535.46 FEET, THENCE SOUTH 43°18'36" WEST 290.80 FEET AND THENCE SOUTH 47°10'54" WEST 229.01 FEET TO THE POINT OF BEGINNING,

BEING A PART OF FRACTIONAL SECTION 7, TOWNSHIP 34 NORTH, RANGE 7 WEST AND CONTAINING 45.86 ACRES WITHIN THE PERIMETER OF THE COURSES DESCRIBED. THE ABOVE DESCRIBED PROPERTY INCLUDES ALL LAND TO THE WATER'S EDGE OF LAKE MICHIGAN NORTHWESTLY OF THE COURSES DESCRIBED AS BEING ALONG SAID SHORE.

Charlevoix Abstract & Engineering Co.

Phone 616 547-9901
FAX 616 547-0041

ABSTRACTS of TITLE
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49720

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DETROIT, MI 48228
(313) 271-0466
FAX (313) 271-7002

Charlevoix Country Club
PHASE II
PROPOSED FUTURE DEVELOPMENT
July 13, 1996
Job No. 13318c.SB

IN THE TOWNSHIP OF HAYES, CHARLEVOIX COUNTY, MICHIGAN; COMMENCING AT A 1-1/4 INCH PIPE AT THE SOUTHWEST CORNER OF SECTION 7, TOWNSHIP 34 NORTH, RANGE 7 WEST; THENCE ALONG THE SOUTH LINE OF SAID SECTION NORTH 76°42'45" EAST (RECORDED AS NORTH 77°32'49" EAST) 1906.90 FEET TO A T-IRON STAKE ON THE SOUTHEASTERLY LINE OF SHELDON COHN PROPERTY AS DESCRIBED IN LIBER 328, PAGE 27, CHARLEVOIX COUNTY RECORDS, BEING THE POINT OF BEGINNING OF THIS DESCRIPTION;

THENCE ALONG THE SOUTHEASTERLY LINE OF SAID COHN PROPERTY NORTH 40°13'26" EAST 94.75 FEET (RECORDED AS NORTH 41°02'35" EAST 95.77 FEET) TO A T-IRON STAKE; THENCE ALONG THE NORTHEASTERLY LINE OF SAID COHN PROPERTY NORTH 58°46'34" WEST RECORDED AS NORTH 58°01'56" WEST) 665.24 TO THE EASTERLY LINE OF PA-BE-SHAN LANE, A 66 FOOT WIDE PRIVATE INGRESS, EGRESS AND UTILITIES EASEMENT, AS RECORDED IN LIBER 261, PAGE 209, CHARLEVOIX COUNTY RECORDS; THENCE ALONG SAID EASTERLY EASEMENT LINE THE FOLLOWING SIX COURSES: NORTH 47°10'54" EAST 229.01 FEET, THENCE NORTH 43° 18'36" EAST 290.80 FEET; THENCE NORTH 42°01'31" EAST 535.46 FEET; THENCE NORTH 37°32'31" EAST 615.00 FEET; THENCE NORTH 26°05'01" EAST 687.20 FEET AND THENCE NORTH 53°44'34" EAST 42.84 FEET TO THE SOUTHERLY LINE OF THE ROBERT L. HANSEN PROPERTY AS DESCRIBED IN LIBER 320, PAGE 98, CHARLEVOIX COUNTY RECORDS; THENCE ALONG THE SOUTHERLY LINE OF SAID HANSEN PROPERTY SOUTH 84°30'10" EAST 952.57 FEET TO A CONCRETE MONUMENT ON THE EAST EIGHTH LINE SAID SECTION; THENCE ALONG THE EAST EIGHTH LINE OF SAID SECTION SOUTH 00°59'58" EAST 1290.30 FEET TO A CONCRETE MONUMENT; THENCE SOUTH 82°24'35" WEST 1259.47 FEET TO A CONCRETE MONUMENT ON THE NORTH AND SOUTH QUARTER LINE OF SAID SECTION; THENCE ALONG SAID LINE SOUTH 01°12'46" EAST 608.00 FEET TO A CONCRETE MONUMENT ON THE SOUTH LINE OF SAID SECTION; THENCE ALONG SAID LINE SOUTH 76°42'45" WEST (RECORDED AS SOUTH 77°32'49" WEST) 683.04 FEET TO THE POINT OF BEGINNING,

BEING A PART OF FRACTIONAL SECTION 7, TOWNSHIP 34 NORTH, RANGE 7 WEST AND CONTAINING 62.57 ACRES WITHIN THE PERIMETER OF THE COURSES DESCRIBED.

HAYES TOWNSHIP - CITY OF CHARLEVOIX
FIRST AMENDMENT TO INTERGOVERNMENTAL AGREEMENT
REGARDING SEWER SYSTEM

BACKGROUND

On approximately September 24,1996 the parties entered into an agreement which allowed the City to extend its sewer system to certain parcels of land in the Township. The parties now wish to modify the initial agreement by adding additional parcels.

AGREEMENT

The City of Charlevoix and Hayes Township agree as follows:

1. The Intergovernmental Agreement Regarding Sewer System is extended to also include the land described in Attachment A

2. The Intergovernmental Agreement Regarding Sewer System remains unchanged except for the addition of the land which has been described above.

CITY OF CHARLEVOIX

Dated: 2/15/2000

By: Alvin Russell
Alvin Russell

Its: Mayor

HAYES TOWNSHIP

Dated: 3/21/2000

By: Timothy Boyko

Its: Supervisor

HAYES TOWNSHIP - CITY OF CHARLEVOIX
SECOND AMENDMENT TO INTERGOVERNMENTAL AGREEMENT REGARDING SEWER SYSTEM

BACKGROUND

On approximately September 24, 1996, the parties entered into an agreement which allowed the City to extend its sewer system to certain parcels of land in the Township. The parties now wish to modify the initial agreement by adding an additional parcel.

AGREEMENT

The City of Charlevoix and Hayes Township agree as follows:

1. The Intergovernmental Agreement Regarding Sewer System is extended to also include the land described in Attachment A.

2. The Intergovernmental Agreement Regarding Sewer System remains unchanged except for the addition of land which has been described in the First Amendment to Intergovernmental Agreement approved in February 2000 and the land which has been described above.

CITY OF CHARLEVOIX

Lea Parker

BY: Alvin D. Russell
Alvin D. Russell
Its: Mayor

HAYES TOWNSHIP

Ethel R Knepp

By: Timothy Boyko
Timothy Boyko
Its: Supervisor

ATTACHMENT A

PROPERTY DESCRIPTION:

For: The City of Charlevoix
Date: May 12, 2000

In the Township of Hayes, Charlevoix County Michigan, **BEGINNING** at a 1/2" pipe at the corner common to Sections 18 & 19, Township 34 North, Range 7 West and Sections 13 & 24, Township 34 North, Range 8 West; thence along the line common to said Sections 18 & 19 North 76°04'44" East 344.31 feet to a 1/2" rod on the Southeasterly line of Highway U.S.-31; thence continuing along said section line North 76°04'44" East 394.01 feet to a 1/2" rod; thence South 34°01'39" East 243.88 feet to a 1/2 " rod; thence South 50°23'33" West 944.71 feet to a 1/2" rod; thence North 34°01'39" West 209.54 feet to a 1/2" rod on the line common to said Sections 19 & 24; thence along said section line North 1°00'51" West 312.02 feet to a 1/2" rod on the Southeasterly line of said Highway; thence continuing along said section line North 1°00'51" West 141.15 feet to the POINT OF BEGINNING, being a part of the Northwest 1/4 of the Northwest 1/4 of Section 19, Township 34 North, Range 7 West and containing 8.637 acres. Subject to the rights of the public and of any governmental unit in any part thereof taken, used or deeded for street, road or highway purposes.

John E. Ferguson, P.S. No. 24959
Job No. SB-16012c.99

STATE of MICHIGAN
JOHN E. FERGUSON
LAND SURVEYOR
24595
REGISTERED LAND SURVEYOR

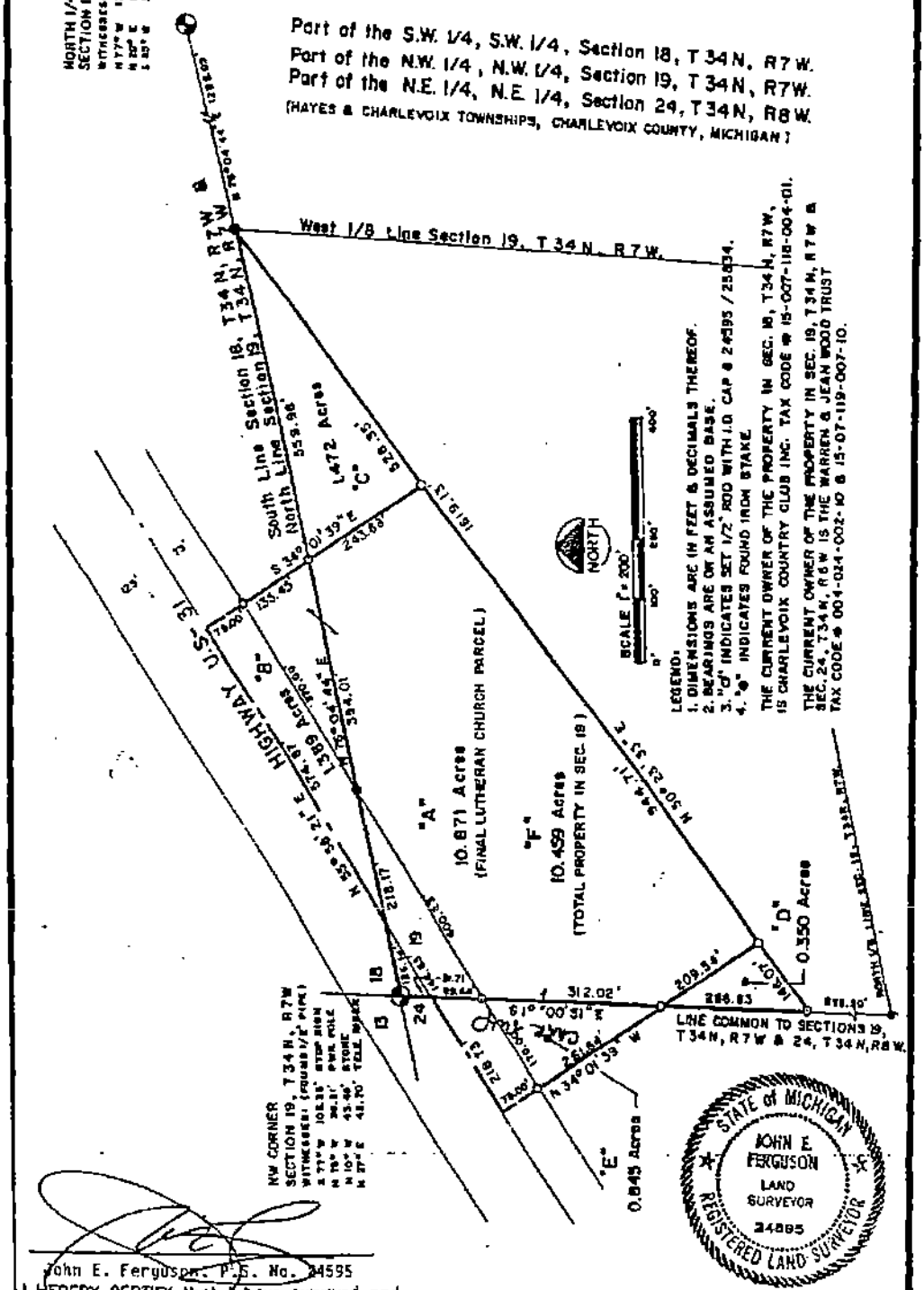
CERTIFICATE OF BOUNDARY SURVEY

SHEET NO. 1 OF 3

CERTIFIED TO:

Lloyd Kirby
1201 Bridge Street
Charlevoix, MI 49720

Part of the S.W. 1/4, S.W. 1/4, Section 18, T 34 N, R 7 W.
Part of the N.W. 1/4, N.W. 1/4, Section 19, T 34 N, R7W.
Part of the N.E. 1/4, N.E. 1/4, Section 24, T 34 N, R8 W.
(HAYES & CHARLEVOIX TOWNSHIPS, CHARLEVOIX COUNTY, MICHIGAN)



John E. Ferguson, P.S. No. 24595

I HEREBY CERTIFY that I have surveyed and mapped the property hereon delineated and that the ratio of position closure of the unadjusted field data exceeds 1:5000; and that it complies with P.A. 132, 1970.

FIELD: G.S.-C.H.	STAKED: 12/2/99	DRAWN: 11/30/99 (JL)
JOB: SB-16012 c.99	DATE: DEC. 1, 1999	

FERGUSON & CHAMBERLAIN ASSOCIATES, INC.
PROFESSIONAL SURVEYORS
103 W. UPRIGHT STREET, CHARLEVOIX, MICHIGAN 49720
(231) 547-9882 — FAX (231) 547-0021
EMAIL: survey@freeway.net

HAYES TOWNSHIP - CITY OF CHARLEVOIX
THIRD AMENDMENT TO INTERGOVERNMENTAL AGREEMENT
REGARDING SEWER SYSTEM

BACKGROUND

On approximately September 24,1996 the parties entered into an Intergovemmental Agreement Regarding Sewer System which allowed the City to extend its sewer system to certain parcels of land in the Township. In February, 2000 the parties executed the First Amendment to Intergovernmental Agreement Regarding Sewer System, which amendment extended the city sewer system to additional parcels of land in the township. The parties then executed the Second Amendment to Intergovernmental Agreement Regarding Sewer System, which amendment further extended the city sewer system to an additional parcel in the township. The parties now wish to modify the initial Intergovernmental Agreement Regarding Sewer System by adding an additional parcel to be served by the city sewer system.

AGREEMENT

The City of Charlevoix and Hayes Township agree as follows:

1. The Intergovernmental Agreement Regarding Sewer System is further extended to also include the land described in Attachment A.

2. The Intergovernmental Agreement Regarding Sewer System remains unchanged except for the addition of the land included as a result of the First Amendment and Second Amendment to the Intergovernmental Agreement Regarding Sewer System and the land which has been described above.

CITY OF CHARLEVOIX

Dated: 10-6-03

By: Gabe Campbell

Gabe Campbell

Its: Mayor

HAYES TOWNSHIP

Dated: 9-23-03

By: Timothy Boyko

Timothy Boyko

Its: Supervisor

DESCRIPTION:

In the Township of Hayes, Charlevoix County, Michigan; Commencing at an iron pipe at the corner common to Sections 12 and 13, Town 34 North, Range 8 West and Sections 7 and 18, Town 34 North, Range 7 West; thence North 77°32'49" East along the line common to said Sections 7 and 18, 756.06 feet to a T-iron stake, being the point of beginning of this description; thence North 33°07'30" West, 807.77 feet to a T-iron stake on the shore of Lake Michigan; thence North 60°55'10" East along said shore 199.37 feet; thence North 52°46'27" East, along said shore, 184.07 feet; thence continuing along said shore, North 38°29'25" East, 214.79 feet to a T-iron stake; thence South 58°01'56" East, 683.72 feet to a T-iron stake in the centerline of a 66. foot roadway easement; thence continuing South 58°01'56" East, 699.72 feet to a T-iron stake; thence South 41°02'35" West, 95.77 feet to a T-iron stake on said line common to Sections 7 and 18; thence continuing South 41°02'35" West, 1119.25 feet to a T-iron stake; thence North 33°07'30" West, 647.08 feet to a T-iron stake in the centerline of said easement; thence continuing North 33°07'30" West, 64.55 feet to the point of beginning; being a part of Government Lot 4, Section 7, Town 34 North, Range 7 West and a part of the North Half of the Northwest Quarter, Section 18, Town 34 North, Range 7 West and containing 28.919 acres. Subject to the burdens and benefits of a 66. foot right-of-way easement, the centerline of which is the Southeasterly line of the above described property. Also subject to the burdens and benefits of a 66. foot right-of-way easement the centerline of which is the Northeasterly line of said property, Northwesterly of Pa-Ba-Shan Lane. Subject to the rights of the public and of any governmental unit in any part thereof taken, used or deeded for streets, roads or highway purposes. The above described property includes riparian rights as defined by the State of Michigan Southeasterly of the courses described as being along the shore of Lake Michigan.

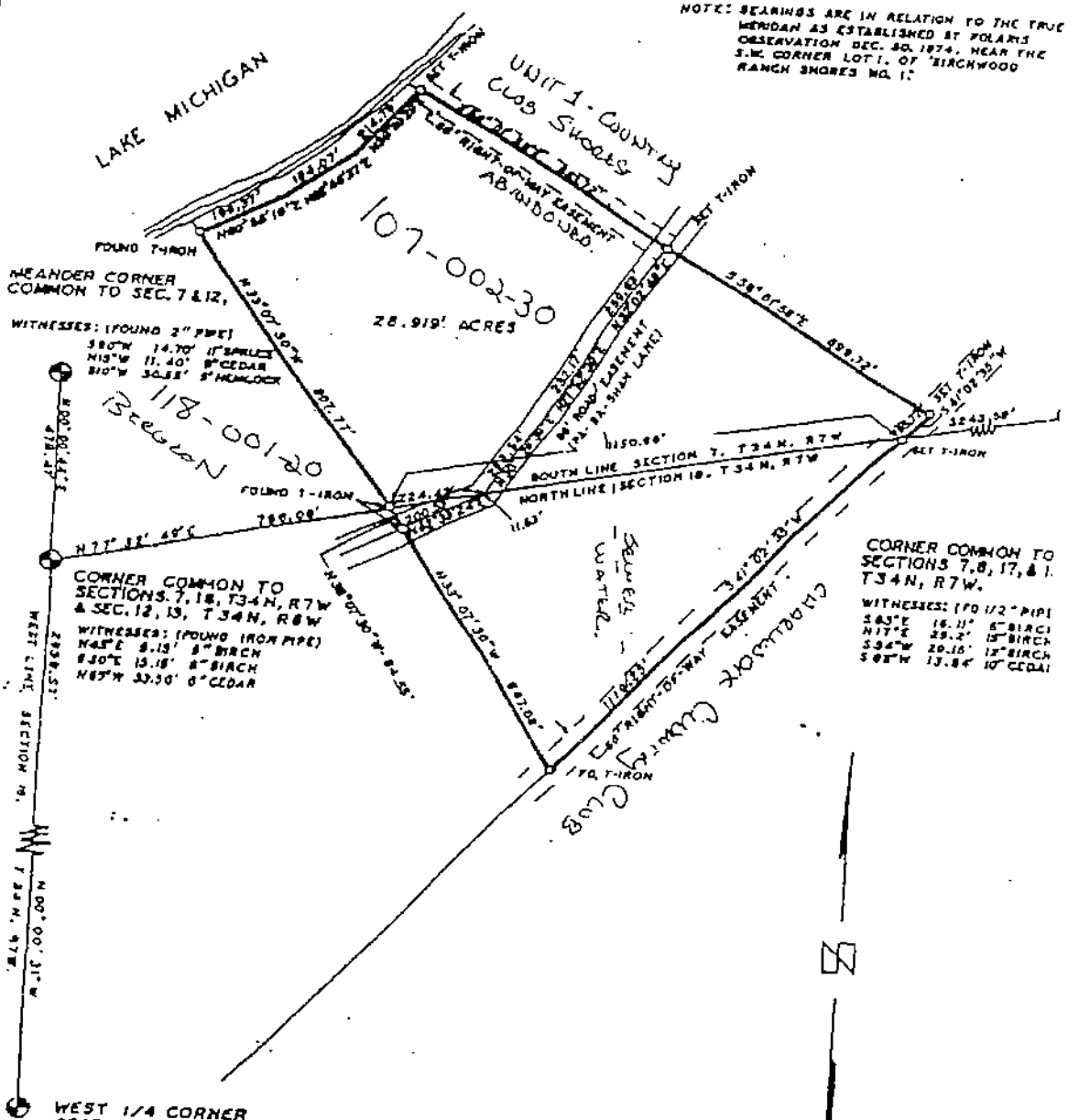
I HEREBY CERTIFY that the survey hereon delineated is true and correct, that the accuracy is within 1:5000, and it complies with P.A. 132- 1970

Lawrence R. Feindt, RLS No. 21566

CHARLEVOIX ABSTRACT & ENGINEERING CO.
CHARLEVOIX, MICHIGAN 49720

FOR: Edward K. Shanahan	
DRAWN BY: J.H.L.	SCALE:
DATE: Dec. 22, 1974	

NOTE: BEARINGS ARE IN RELATION TO THE TRUE MERIDIAN AS ESTABLISHED BY POLARIS OBSERVATION DEC. 30, 1974, NEAR THE S.W. CORNER LOT 1, OF "BIRCHWOOD RANCH SHORES NO. 1."



PARCEL IS PART OF GOVT. LOT 4, SEC. 7 T34N, R7W. & PART OF THE NW 1/4 OF THE NW 1/4, SEC. 18, T34N, R7W.

HAYES TOWNSHIP CHARLEVOIX CO.

I HEREBY CERTIFY that the survey hereon delineated is true and correct, that the accuracy is within 1:6000, and it complies with P.A. 132- 1970

FWN. BY: T.P. GROSE, D.J. BATDORFF, J.J. HOCHHALTER

LAWRENCE R. FEINDT RLS NO. 21566

CHARLEVOIX ABSTRACT & ENGINEERING CO.
CHARLEVOIX, MICHIGAN 49720

FOR EDWARD K. SHANAHAN

DRAWN BY: JH LA BEAU | SCALE: 1" = 300

HAYES TOWNSHIP - CITY OF CHARLEVOIX
FOURTH AMENDMENT TO INTERGOVERNMENTAL AGREEMENT
REGARDING SEWER SYSTEM

BACKGROUND

On approximately September 24,1996 the parties entered into an Intergovernmental Agreement Regarding Sewer System which allowed the City to extend its sewer system to certain parcels of land in the Township. The parties have periodically amended this initial Agreement to include additional land. The parties now wish to modify the initial Intergovernmental Agreement Regarding Sewer System by adding additional land which will be served by the city sewer system.

AGREEMENT

The City of Charlevoix and Hayes Township agree as follows:

1. The Intergovernmental Agreement Regarding Sewer System is further extended to also include the land described in Attachment A.

2. The Intergovernmental Agreement Regarding Sewer System remains unchanged except as provided in each of its subsequent amendments.

CITY OF CHARLEVOIX

Dated: 12-15-03

By: Gabe Campbell

Gabe Campbell

Its: Mayor

HAYES TOWNSHIP

Dated: 12/08/03

By: Timothy Boyko

Timothy Boyko

Its: Supervisor

LEGAL DESCRIPTION

In the Township of Hayes, Charlevoix County, Michigan, COMMENCING at a 1/2" pipe at the comer common to Sections 18 & 19, Township 34 North, Range 7 West and Sections 13 & 24, Township 34 North, Range 8 West; thence along the line common to said Sections 18 & 19 North 76°04'44" East 738.32 feet to a 1/2" rod being the POINT OF BEGINNING of this description; thence North 34°01'39" West 135.45 feet to a 1/2" rod on the Southeasterly line of Highway U.S. 31, thence continuing North 34°01'39" West 75.00 feet to the centerline of said highway; thence along said centerline North 55°58'21" East 1222.54 feet; thence leaving said centerline South 1°31'09" East 88.93 feet to a 1/2" rod on the Southeasterly line of said highway; thence continuing South 1°31'09" East 543.72 feet to a 1/2" rod on said section line; thence along said section line South 76°04'44" West 14.83 feet to a 1/2" rod; thence South 5°59'01" East (recorded as South 4°25'25" East) 601.71 feet to a 1/2" rod; thence South 87°59'36" West 398.87 feet to a 1/2" rod on the West 1/8 line of said section, as monumented; thence along said 1/8 line South 2°00'25" East (recorded as South 0°21'49" East) 790.80 feet to a 1" rod on the North 1/8 line of said Section 19, thence along said North 1/8 line South 76°18'45" West 1320.47 feet to a 3/4" pipe on the West line of said Section 19; thence along said section line North 1°00'51" East 862.03 feet to a 1/2" rod; thence leaving said section line South 34°01'39" East 209.54 feet to a 1/2" rod; thence North 50°23'33" East 944.71 feet to a 1/2" rod; thence North 34°01'39" West 243.88 feet to the POINT OF BEGINNING, being a part of the North ½ of the Northwest 1/4 of Section 19, and a part of the South ½ of the Southwest 1/4 of Section 18, all in Township 34 North, Range 7 West and containing 44.515 acres. Subject to the rights of the public and of any governmental unit in any part thereof taken, used or deeded for street, road or highway purposes.

ATTACHMENT A

HAYES TOWNSHIP - CITY OF CHARLEVOIX
FIFTH AMENDMENT TO INTERGOVERNMENTAL AGREEMENT
REGARDING SEWER SYSTEM

BACKGROUND

On approximately September 24,1996 the parties entered into an Intergovernmental Agreement Regarding Sewer System which allowed the City to extend its sewer system to certain parcels of land in the Township. The parties have periodically amended this initial Agreement to include additional land. The parties now wish to modify the initial Intergovernmental Agreement Regarding Sewer System by adding additional land which will be served by the city sewer system.

AGREEMENT

The City of Charlevoix and Hayes Township agree as follows:

1. The Intergovernmental Agreement Regarding Sewer System is further extended to also include the land described in Attachment A.

2. The Intergovernmental Agreement Regarding Sewer System remains unchanged except as provided in each of its subsequent amendments.

CITY OF CHARLEVOIX

Dated: 10-11-05

By: _____
Norman L. Carlson, Jr.

Its: Mayor

HAYES TOWNSHIP

Dated: 8-08-05

By: _____
Timothy Boyko

Its: Supervisor

CITY OF CHARLEVOIX
210 STATE ST. CHARLEVOIX, MICH. 49720

Attachment A

Property located in the Township of Hayes, County of Charlevoix, State of Michigan, to wit Plat of Pine Point, Charlevoix County, Blocks 9, 10, 11 and 12 as recorded on the 15th day of March, 1913 in Liber 2 of Plats on Page 6 in the Charlevoix County Register of Deeds Office

SEWAGE SYSTEM ADDITION AGREEMENT

This Agreement is entered into on the 7 day of May, 2002, among: the City of Charlevoix, a Michigan municipal corporation operating under the Home Rule City Act, MCLA 117.1, *et seq.*, as amended, whose address is 210 State Street, P.O. Box 550, Charlevoix, Michigan 49720 (the "City"); the Township of Marion, a general law township operating under the General Township Act, MCLA 41.1, *et seq.*, as amended, whose mailing address is 1546 Potter Road, Charlevoix, Michigan 49720, and the Township of Charlevoix, a general law township operating under the General Township Act, MCLA 41.1, *et. seq.*, as amended, whose address is 12491 Waller Road, Charlevoix, Michigan 49720 (collectively the "Townships"); and Charlevoix Public Schools, a Michigan general powers school district organized and operating under the provisions of the Revised School Code, MCLA 380.1, *et seq.*, as amended, whose address is 208 Clinton Street, Charlevoix, Michigan 49720 (the "School"). A reference to a Township shall apply to each Township individually.

PREAMBLE

WHEREAS, the City and Townships are authorized to separately purchase, acquire, construct and improve sewage systems and, to operate and maintain the same within and without their respective corporate or jurisdictional limits; and

WHEREAS, the City and Townships are empowered to exercise jointly any power, privilege, or authority which they share in common, which each might exercise separately; and

WHEREAS, the City and Townships deem it in the best interests of their citizens to provide for certain sewer improvements to be made within the Townships which will be initially financed by the School, with a portion of the School's investment to be repaid by methods set forth below; and

WHEREAS, the School has the authority to enter into this Agreement;

AGREEMENT

NOW THEREFORE, the parties, acting through their legally authorized representatives and in consideration of the mutual promises contained in the Agreement, agree as follows:

ARTICLE I
INTRODUCTION

A. Purpose. The purpose of this Agreement is to specify the terms under which: (a) the City will construct sewer system improvements to serve the School's new high school site on Marion Center Road; (b) the School will pay for said sewer system improvements and be returned a portion of its investment; and (c) to further specify the obligations of the City, the Townships and the School.

B. Authority. The City and Townships enter into this contract under the authority of state statutes authorizing intergovernmental contracts and pursuant to MCLA 123.214, as amended, and pursuant to action of each Township's Board of Trustees. The City enters this contract with the School under the authority of Sections 1.3 and 1.4 of the City Charter and pursuant to action of the City Council. The School enters into this contract under the authority of MCLA 380.11a(3) and pursuant to action of the School's Board of Education.

ARTICLE II
PROJECT

A. City's Responsibilities. The City is in the process of constructing a lift station (known as "Pump Station #3") at the northwest corner of the intersection of US-31 and Marion Center Road. The City has also incurred costs to construct a sanitary sewer (known as "Initial Marion Center") across US-31 and under the recently constructed Marion Center Road.

The City agrees to construct a sanitary sewer system extending out from Marion Center Road to the south to a point opposite the high school site (as shown in Attachment One) which shall be constructed and completed in accordance with engineering documents prepared by John Adams and Associates, Inc.

The City also agrees to construct a sanitary sewer system, including a force main and lift station, on the high school site to initially serve the high school site only.

The City also agrees to collect a "privilege" fee, various collection system fees and a construction fee as outlined in Article IV; refund various collected collection system fees and construction fees to the School as outlined in Article IV; and, set aside the "oversizing" collection system fee for future improvements as defined in Article IV.

The City also agrees to maintain all sewers and lift stations it owns and will construct pursuant to this agreement, including the force main and lift station on the high school site, as a public sewer system.

The City shall perform its responsibilities with due diligence.

The School shall have the right to review and approve all construction contracts. The City shall have the right to approve or disapprove all change orders relating to the construction contracts. However, the City shall promptly advise the School of any change orders which are approved and which exceed 5% of the total amount of the construction contract. The School shall be a third party beneficiary to all construction contracts.

The City also agrees to pay one-half of the actual attorney fees incurred by Charlevoix Township and Marion Township in connection with the development and/or review of this Agreement and the franchise ordinance and in connection with the township attorney's preparation for and participation in planning commission and township board meetings necessary for approval of the sanitary lift station and sewer pipes within the Townships.

B. School's Responsibilities. The School shall pay for various projects, including engineering costs, as outlined in Article III. The School shall provide an easement on the high school site to allow for construction and maintenance of the sewer force main and lift station to be constructed on the high school site.

The School shall pay the monthly fees for electric service to operate the lift station on the high school site. The School shall construct, own and maintain sewers connecting to the lift station on the high school site.

The School shall pay for any attorney costs the City incurs in the development of this Agreement. Said costs shall be considered part of the Marion Center Project Costs.

The School also agrees to pay one-half of the actual attorney fees incurred by Charlevoix Township and Marion Township in connection with the development and/or review of this Agreement and the franchise ordinance and in connection with the township attorney's preparation for and participation in planning commission and township board meetings necessary for approval of the sanitary lift station and sewer pipes within the Townships. Said costs shall be considered part of the Marion Center Project Costs.

The School shall pay to the City all costs or charges for which it is responsible under this agreement to the City as soon as possible, upon receipt of documentation which details the amount owed to the City and the purpose of the amount owed. When the request for payment is for construction costs, the payment to the City shall be made with such promptness that the City can issue a check for full payment of the contract draw to the contractor for the total amount of the draw without having to make the draw payment using City funds.

C. Township's Responsibilities. As provided in Article VI.R, a franchise ordinance in a form acceptable to the City has become effective in each Township prior to the City's execution of this Agreement. In the event that either or both of the Townships repeal or amend the franchise ordinance so that it is unacceptable to the City, then the City may, at its discretion, terminate this Agreement and end all sewer and/or water services within either or both Townships as the City may elect. The City shall handle all applications for tap-ins, billing, collection and other matters related to sewer usage by Townships residents in such manner as the City shall deem advisable, including dealing directly with sewer system users.

The City shall handle all such administrative matters relating to sewer usage at its own expense. The Townships will administratively assist the City with any remedy authorized by City ordinance or state law relating to unpaid fees, rates or charges for sewer services. The City shall have the right to request termination of water service and the Townships agree to terminate water service at the City's request as a remedy for overdue sewer customer accounts whenever such customer is served by City sewer

and Township water services. The termination of water service shall not restrict the City from using any other remedy available to it for the collection of unpaid sewer rates, charges or fees.

D. Connection. The School shall not connect to the sewer system until all fees outlined in this Agreement have been paid, the sewer ordinances as described in Article II.C have become effective in both Townships and the City notifies the School in writing that the sewer system improvements have been constructed according to their plans and specifications.

E. Ownership and Maintenance. The City shall own and maintain all sewer lines constructed on Marion Center Road and the lift station and force main on the high school site. The School shall own and maintain all sewer lines flowing into the lift station on the School site.

F. Easements. If the City must procure and/or purchase easements to implement the collection system in the construction of the sewer system to the high school site, then the costs of obtaining such easements, including legal expenses, shall be part of the proposed Marion Center Project Costs. The City does not anticipate that any costs will be incurred for these easements. However, if costs will be incurred in obtaining any easements, the City shall obtain the approval of the school before any such costs are incurred.

ARTICLE III
PROJECT COSTS AND FUNDING

A. Pump Station #3. The estimated local share of the construction of Pump Station #3 is $42,841. Final figures will be calculated upon close out of the project. The School is required to pay the estimated $42,841 to the City within thirty (30) days of the effective date of this Agreement. Any adjustment due to either the School or the City based on final project close out will be paid to the owed party within thirty (30) days of final close out calculation.

B. Initial Marion Center Construction. The estimated local share of the construction of a sanitary sewer system across US-31 and under the recently constructed portion of Marion Center Road is $85,000. The School shall pay the estimated $85,000 to the City within thirty (30) days of the effective date of this

Agreement. Any adjustment due to either the School or the City based on final project close out will be paid to the appropriate party within thirty (30) days of the final close out calculation.

C. Primary Marion Center Construction. The cost of constructing a sanitary sewer system along Marion Center Road connecting to the initial Marion Center system and extended to a point opposite the high school site is estimated at $282,823.00 including associated engineering costs. The City has also incurred $9,200.00 in engineering costs to provide estimates of cost to construct the sewer. The City has also incurred engineering fees for the design of the Primary Marion Center Construction and the School has reimbursed the City for those engineering costs. The amount of this reimbursement shall be considered part of the Primary Marion Center Construction Costs.

D. High School Site. The cost of constructing a sanitary sewer pump station and force main on the high school site shall be paid by the School and is estimated at $93,345 including associated engineering costs. The payment schedule shall be included as outlined in subsection C, above.

E. Oversizing from Pump Station #3 to Wastewater Treatment Plant. It is estimated that with the addition of approximately 1,100 REUs to Pump Station #3 the lines between Pump Station #3 and the wastewater treatment plant will have to be increased in size. The estimated cost in 2001 dollars to fund the oversizing is $611,000. The City will fund the cost of this improvement with proceeds collected as "Collection System Fees – Oversizing from Pump Station #3 to Wastewater Treatment Plant" described below. As used in this Agreement, the term REU shall mean a residential equivalent unit as defined by the Table of Unit Factors passed by the Charlevoix City Council by Resolution 84-7-3, adopted July 16, 1984. By way of example only, one REU generally equals the average sewer effluent generated by one household.

F. School Attorney Fees. The attorney fees incurred by the school relating to the review by its attorney of this Agreement shall be deemed to be a Primary Marion Center Construction Cost and is subject to reimbursement as one of those costs.

ARTICLE IV

FEES AND SCHOOL REIMBURSEMENT

A. Collection System Fees.

1. Collection System Fee - Pump Station #3. A collection system fee of $50 per REU shall be collected by the City from all properties depicted on Attachment Two -- Areas A — //////; C — XXXXX and D — \\\\\\\\. Said collection system fees paid to the City in any calendar year shall be paid to the School without interest by March 1st of the following year. Said fees shall continue to be paid to the School until the final calculated figure of the local cost of Pump Station #3 has been refunded or ending with the 2021 calendar year payment, whichever occurs first.

2. Collection System Fee - Initial Marion Center Construction. A collection system fee of $200 per REU shall be collected by the City from all properties depicted on Attachment Two -- Areas A — //////; C — XXXXX and D — \\\\\\\\. Said collection system fees paid to the City in any calendar year shall be paid to the School without interest by March 1st of the following year. These fees shall continue to be paid to the School until the final calculated figure of the local cost of the "Initial Marion Center Construction" has been refunded or ending with the 2021 calendar year payment, whichever occurs first.

3. Collection System Fee - Primary Marion Center Construction. A collection system fee of $550 per REU shall be collected from all properties depicted on Attachment Two -- Area C — XXXXX and Area D — \\\\\\. Said collection system fees paid to the City in any calendar year shall be paid to the School without interest by March 1st of the following year. These fees shall continue to be paid to the School until the final calculated figure of the Primary Marion Center Construction Costs have been refunded or ending with the 2021 calendar year payment, whichever occurs first.

4. Collection System Fee - Oversizing from Pump Station #3 to Wastewater Treatment Plant. A collection system fee of $700 per REU shall be collected by the City from all properties depicted in Attachment Two -- Area A — //////, Area C — XXXXX, and Area D — \\\\\\. The School will not be reimbursed by any of these fees.

B. Construction Fee. A construction fee of $1,500.00 per REU shall be collected by the City from all properties depicted in Attachment Two --Area C. Any fees collected pursuant to this subsection shall be paid to the School without interest as reimbursement for Primary Marion Center Construction Costs. The reimbursement to the School shall continue until final calculated figure of the Primary Marion Center Construction Costs have been refunded or ending with the 2021 calendar year payment, whichever occurs first.

C. Privilege Fee. The City has the right to impose and shall collect a "privilege" fee for any connections to the City sewer system. These fees are currently $1,000 per REU for parcels in the City and $1,500 per REU for parcels outside of the City. The City shall have the right to modify these fees as it deems advisable.

D. School REUs. For the purposes of this agreement and the application of City sewer-related ordinances and policies, the high school shall be deemed to have 6.7 REUs. This determination regarding REUs shall remain in effect only as long as the site plan and special use permit approved for the high school site by Marion Township remain unchanged. If there is a change in the site plan or special use permit, then the REUs shall be determined by the City based on generally accepted engineering practices after taking into consideration any change in use or intensity of use at the site currently known as the high school site.

E. Current Fees Applicable to School. The School shall pay collection system fees and a privilege fee as described in Article IV. Since the School is deemed to have 6.7 REUs and the combined total of collection system fees pursuant to Article IV.A.1, 2 and 3 is $800.00, the total collection system fees for these provisions are $5,300.00. This portion of the School's collection system fees shall be deemed to be reimbursable costs the School. The School shall also pay the collection system fee as described in Article IV.A.4. Since the School is deemed to have 6.7 REUs and this collection system fee is $700.00 per REU, the total collection system fee pursuant to Article IV.A.4 is $4,690.00. This portion of the collection system fees is not reimbursable to the School and shall be retained by the City. The School shall also pay the privilege fee described in Article IV.C. Since the School is deemed to have 6.7 REUs and the privilege fee is $1,500.00 per REU, the total privilege fee pursuant to Article IV.C. is $10,050.00. The privilege fee is not reimbursable to the School and shall be retained by the City.

F. Continuation of Fees. Once the City's obligation to reimburse the School for all allowable project costs has ended, the City may continue to impose and collect the fees described in this Article IV. Such fees will be used by the City for future expansion of the wastewater treatment plant and/or for sewer system repairs or construction.

ARTICLE V
TAPS

A. Tap and Use Restrictions. The City shall have the right to establish restrictions on the type of sewage or effluent permitted in the system and the right to refuse to accept any tap where there is reason to believe that resulting sewage would be untreatable or may damage or impair the City's sewer facilities or operations.

B. Capacity Limitations. After connection by the School, the City shall have the right to place a moratorium on future taps or extensions to the City sewer system or any portion or part thereof at any time the City determines that the City sewer system or any additions thereto have reached its designed capacity or any emergency exists which prudent engineering practice dictates a moratorium on further taps. If such an emergency develops, the City shall take reasonable steps to rectify the emergency with due diligence.

ARTICLE VI
MISCELLANEOUS

A. Rates. The monthly service charge, commodity charge, terminated service turn-on fee or any other fee or charge (collectively the "City Fees") relating to sewer services for Township parcels shall be 1.5 time the fees or charges for City residents. The School shall pay the same fees as any other parcel located in Marion Township. The City may change any of its fees or charges, except the 1.5 multiplier, at any time without notice. This provision shall not be construed as limiting the City's right to set different multipliers for non-township parcels. As part of the consideration for this contract, the parties to this contract agree to waive any right they may now or hereafter have to challenge the reasonableness, legality or fairness of the City's rates or the multiplier. It is acknowledged that the law regarding multiplier rates and charges to non-City residents may now or in the future require cost justified rate multipliers. The parties waive any such requirements and agree that the City shall bear no burden to justify the

1.5 multiplier on a cost basis. The City shall send bills for its rates for sewer or other charges directly to customers and may accept payments directly from the customers.

B. Litigation Expenses, Hold Harmless Agreement, and Risk Assumption. If the Townships, the City, and/or the School are named as defendants in lawsuits which challenge this contract or any provision thereof, except for a challenge to City rates as described in Article VI.A., the parties agree that each shall seek legal representation in the lawsuit from their respective insurance carriers, if available. The parties further agree that if the Townships and/or the City insurance policies provide a deductible, then the School shall reimburse the Townships and/or the City for one-half the deductible expense actually paid by the Townships and/or the City. If no insurance defense coverage is available to the Townships and/or the City, the parties agree that at no cost to the Townships and/or the City, the attorney representing the School in the lawsuit shall also represent the Townships and/or the City in the litigation, provided in the sole discretion of the Townships and/or the City there is no conflict in this joint representation. If the Townships and/or the City determines there is a conflict in joint representation in the lawsuit, then the Townships and/or the City shall obtain their own legal representation in the lawsuit. The School shall then reimburse the Townships and/or the City for 50% of all attorney fees, court costs and expenses which are incurred by the Townships and/or the City as a result of the lawsuit. The City shall assume its own responsibility for costs or liability related to Article VI.A. without indemnification from any other party. For example, if a Township and/or the City is a named defendant without the School being named a defendant, then the School will reimburse the Townships and/or the City for 50% of the Townships' and/or City's attorney fees, court costs and expenses as described above. If the School is named a defendant along with either Township or the City (regardless of whether there are other defendants as well), then the School will be responsible for its own defenses costs and will also reimburse the Townships and/or the City for 50% of the Townships' and/or City's attorney fees, court costs and expenses.

C. Term of School Reimbursement. The City shall be obligated to the School to accumulate and disburse the specified collection system fees and construction fees to the School until the School has been refunded without interest all

items identified for reimbursement in Article IV or ending with the previously described 2021 calendar year payment, whichever occurs first.

D. Other Connections -- Marion Township. In addition to the School's new high school site on Marion Center Road, those lands as depicted in Attachment Three are authorized to connect to the City's sewer system and its extensions into Marion Township. However, there shall be no other connections to the sewer system improvements in Marion Township unless the Township Board of Trustees approves a resolution authorizing the connection.

E. Amendments. This Agreement may be amended only by a written document executed by all parties to this Agreement.

F. Severability. It is understood and agreed by the parties hereto that if any part, term or provision of this Agreement is held to be illegal or in conflict with any law of the state or federal government by a court of competent jurisdiction, the validity of the remaining portions or provisions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if this Agreement did not contain the particular part, term or provision held to be invalid.

G. Entire Agreement. This Agreement embodies the whole agreement of the parties. There are no promises, terms, conditions or obligations other than those contained herein; and this Agreement shall supercede all previous communications, representations or agreements either verbal or written between the parties hereto.

H. Applicable Law. This Agreement shall be construed and governed by the laws of the State of Michigan.

I. No Assignment. This Agreement shall not be assignable without the written consent of all parties hereto, which consent shall not be unreasonably withheld.

J. Binding on Successors. This Agreement shall enure to the benefit of the successors and assigns, if any, of the respective parties hereto.

K. Breach. In the event of a breach of this Agreement, the non-breaching party shall provide the breaching party with written notice of the breach. In the event that the breaching party fails to correct the breach within thirty (30) days from receipt of notice of the breach, the non-breaching party may terminate this Agreement, may exercise its rights under this Agreement and/or pursue all of its legal and equitable claims.

L. Effective Date. This Agreement shall be effective upon the last of the parties to execute it.

M. Addresses. The addresses to whom notices shall be sent under this contract are:

City of Charlevoix Attn: City Manager P.O. Box 550 Charlevoix, MI 49720	Township of Marion Attn: Township Supervisor 1546 Potter Road Charlevoix, MI 49720
Township of Charlevoix Attn: Township Supervisor 12491 Waller Road Charlevoix, MI 49720	Charlevoix Public Schools Attn: Superintendent of Schools 208 Clinton Street Charlevoix, MI 49720

N. Additional Documents. The parties shall execute such additional documents, such as with a bank, as are necessary to effectuate the terms of this contract.

O. Headings. Headings on the above paragraphs or sentences are intended for organizational purposes only. To the extent that there is a conflict between a heading and any text, the text shall govern.

P. Time of Essence. Time shall be of the essence in this contract. There shall be compliance with all time periods. All consequences resulting from a failure to meet a time deadline are deemed reasonable and necessary because of the complexity, financial implications and municipal planning implications of this Agreement.

Q. Counterparts. This Agreement may be executed in one or more counterparts, including facsimile copies, each of which shall be deemed an original, but all of which shall together constitute one in the same instrument.

R. Pre-signing Requirement. Prior to signing this Agreement, the City has required that: (i) Marion Township enact a franchise ordinance in a form acceptable to the City with the City as the franchisee for the providing sewer and electrical services within the Township and the right to use public roads within the Township to assist in the providing of such services and (ii) Charlevoix Township enact a franchise ordinance in a form acceptable to the City with the City as the franchisee for the providing water, sewer and electrical services within the Township and the right to use public roads within the Township to assist in the providing of such services.

IN WITNESS of this Agreement the parties by their authorized representatives have executed this Agreement on the date set forth below.

CITY OF CHARLEVOIX

Date: 5-3-02

By: Alvin Russell
Alvin Russell

Its: Mayor

By: Elizabeth A. Gooch
Elizabeth A. Gooch

Its: Clerk

TOWNSHIP OF MARION

Date: 5/7/02

By: Wilson R. Boss
Wilson R. Boss

Its: Supervisor

By: Robert Drebenstedt
Robert Drebenstedt

Its: Clerk

TOWNSHIP OF CHARLEVOIX

Date: 5-02-02

By: Oscar P Stroud
Oscar P. Stroud

Its: Supervisor

By: Carol Martin
Carol Martin

Its: Clerk

CHARLEVOIX PUBLIC SCHOOLS

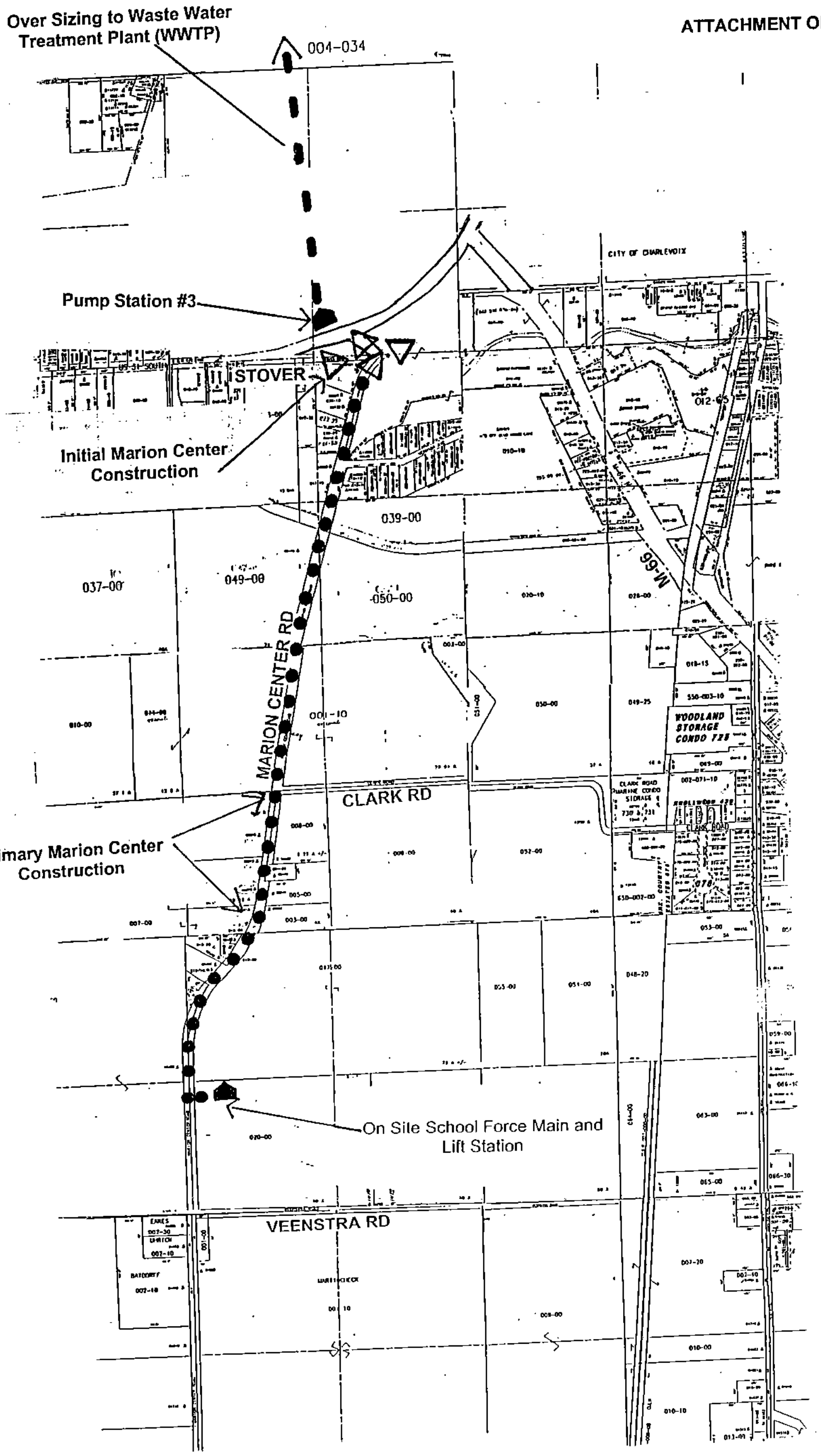
Date: 5/3/02

By: _____
Dr. John Sturock

Its: Superintendent of Schools

[school sewer agreement 3-20-02 final]

ATTACHMENT ONE



ATTACHMENT TWO

The intention of defining properties in Area A — ///// is as follows:

A. The properties are not connected to the sanitary sewer system as of October 1, 2001.

B. The properties were not included in Charlevoix Township's 1984 sanitary sewer special assessment district.

C. Not included in the area defined as Area B - Vernida Avenue

The intention of defining properties in Area B — °•°• Vernida Avenue is as follows:

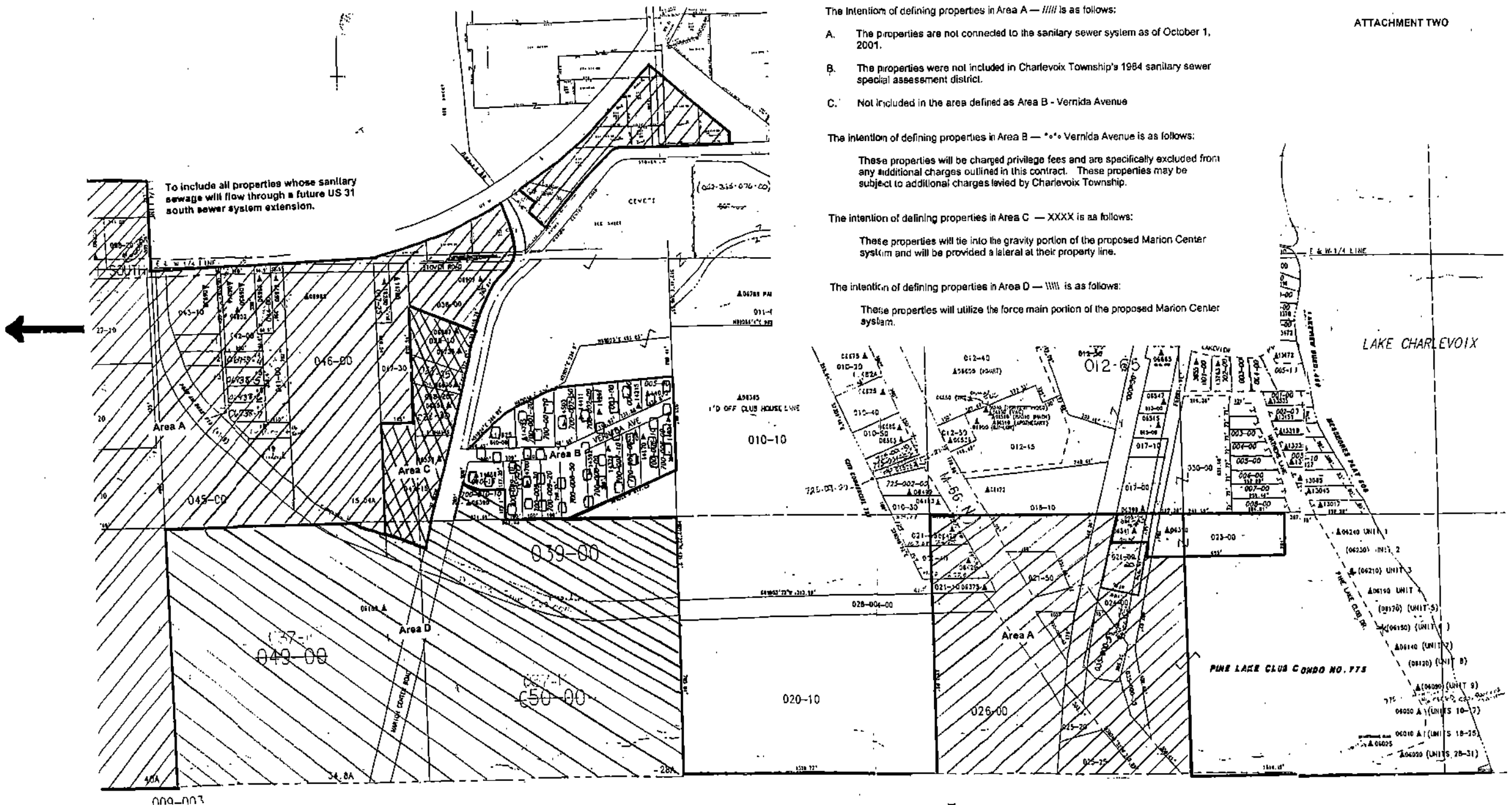
These properties will be charged privilege fees and are specifically excluded from any additional charges outlined in this contract. These properties may be subject to additional charges levied by Charlevoix Township.

The intention of defining properties in Area C — XXXX is as follows:

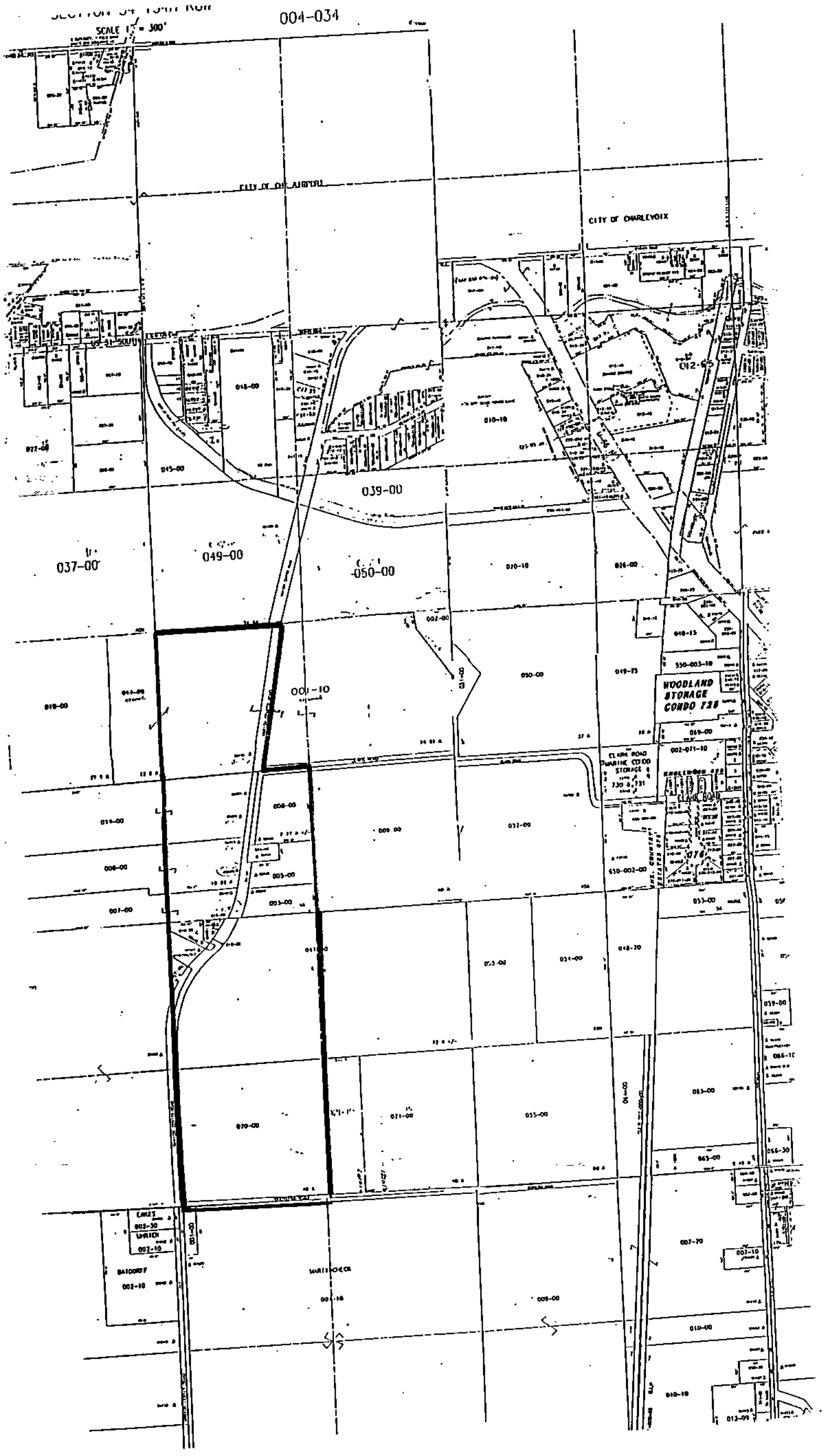
These properties will tie into the gravity portion of the proposed Marion Center system and will be provided a lateral at their property line.

The intention of defining properties in Area D — \\\\\ is as follows:

These properties will utilize the force main portion of the proposed Marion Center system.



ATTACHMENT THREE



FIRST ADDENDUM TO SEWAGE SYSTEM ADDITION AGREEMENT

This Addendum supplements the Sewage System Addition Agreement (Agreement) which has been executed by: the City of Charlevoix, a Michigan municipal corporation operating under the Home Rule City Act, MCLA 117.1, *et seq.*, as amended, whose address is 210 State Street, P.O. Box 550, Charlevoix, Michigan 49720 (the "City"); the Township of Marion, a general law township operating under the General Township Act, MCLA 41.1, *et seq.*, as amended, whose mailing address is 1546 Potter Road, Charlevoix, Michigan 49720, and the Township of Charlevoix, a general law township operating under the General Township Act, MCLA 41.1, *et. seq.*, as amended, whose address is 12491 Waller Road, Charlevoix, Michigan 49720 (collectively the "Townships"); and Charlevoix Public Schools, a Michigan general powers school district organized and operating under the provisions of the Revised School Code, MCLA 380.1, *et seq.*, as amended, whose address is 208 Clinton Street, Charlevoix, Michigan 49720 (the "School"). This Addendum is only between the city and the School. The Townships are not parties to this Addendum because the subject matter of the Addendum relates only to rights and obligations relating to the City and the School.

AGREEMENT

NOW THEREFORE, the parties, acting through their legally authorized representatives and in consideration of the mutual promises contained in the Agreement, agree as follows:

ARTICLE I
INTRODUCTION

A. Purpose of Addendum. As described in the Agreement, the City will construct sewer system improvements (the Project) to serve the School's new high school site on Marion Center Road and the School will pay for the sewer system improvements and be returned a portion of its investment if other persons or entities tap into the sewer system improvements. It is anticipated that there may be attempts by third parties to delay the Project by legal proceedings. This Addendum is intended to clarify the rights and obligations of the parties if the Project is canceled for any reason or if Project costs increase due to delays in completion of the Project. It is the belief of

the parties that this Addendum is consistent with the spirit and intent of the Agreement and does not actually change the Agreement.

B. Authority. Representatives of the City and School have executed this Addendum pursuant to authorization by the City Council and the School's Board of Education, respectively.

ARTICLE II

PAYMENT OF COSTS

A. School's Responsibilities. The School's obligation to pay all Project costs, as outlined in Article III of the Agreement, remains unchanged. This obligation to pay Projects costs shall also include the payment of all costs which the City is legally obligated to pay due to cancellation of the Project or due to increased Project costs caused by a delay in completion of the Project unless the delay is caused by an act or omission of the City.

ARTICLE III

OTHER AGREEMENT PROVISIONS

A. Rights & Obligations Unchanged. The rights and obligations of the parties in the Agreement remain unchanged except to the extent that this Addendum clarifies or delineates those rights and obligations.

ARTICLE VI

MISCELLANEOUS

A. Severability. It is understood and agreed by the parties hereto that if any part, term or provision of this Addendum is held to be illegal or in conflict with any law of the state or federal government by a court of competent jurisdiction, the validity of the remaining portions or provisions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if this Agreement did not contain the particular part, term or provision held to be invalid.

B. Entire Agreement. The Agreement and this Addendum embody the whole agreement of the parties. There are no promises, terms, conditions or obligations other than those contained herein; and the Agreement and this Addendum shall

supercede all previous communications, representations or agreements either verbal or written between the parties hereto.

C. Applicable Law. This Agreement shall be construed and governed by the laws of the State of Michigan.

D. No Assignment. This Addendum shall not be assignable without the written consent of all parties hereto, which consent shall not be unreasonably withheld.

E. Binding on Successors. This Addendum shall enure to the benefit of the successors and assigns, if any, of the respective parties hereto.

F. Effective Date. This Agreement shall be effective upon the last of the parties to execute it.

G. Additional Documents. The parties shall execute such additional documents, such as with a bank, as are necessary to effectuate the terms of this contract.

H. Headings. Headings on the above paragraphs or sentences are intended for organizational purposes only. To the extent that there is a conflict between a heading and any text, the text shall govern.

I. Counterparts. This Agreement may be executed in one or more counterparts, including facsimile copies, each of which shall be deemed an original, but all of which shall together constitute one in the same instrument.

IN WITNESS of this Agreement the parties by their authorized representatives have executed this Agreement on the date set forth below.

CITY OF CHARLEVOIX

Date: 5-3-02 By: Alvin Russell
Alvin Russell

Its: Mayor

By: Elizabeth A. Gooch
Elizabeth A. Gooch

Its: Clerk

CHARLEVOIX PUBLIC SCHOOLS

Date: 5/3/02 By: _____

Dr. John Sturock

Its: Superintendent of Schools

[1st Addendum 4-26 draft]

SECOND ADDENDUM TO SEWAGE SYSTEM ADDITION AGREEMENT

This Second Addendum supplements the Sewage System Addition Agreement ("Agreement") which has been executed by: the City of Charlevoix, a Michigan municipal corporation operating under the Home Rule City Act, MCLA 117.1, *et seq.*, as amended, whose address is 210 State Street, P.O. Box 550, Charlevoix, Michigan 49720 (the "City"); the Township of Marion, a general law township operating under the General Township Act, MCLA 41.1, *et seq.*, as amended, whose mailing address is 1546 Potter Road, Charlevoix, Michigan 49720, and the Township of Charlevoix, a general law township operating under the General Township Act, MCLA 41.1 *et seq.*, as amended, whose address is 12491 Waller Road, Charlevoix, Michigan 49720 (collectively the "Townships"); and the Charlevoix Public Schools, a Michigan general powers school district organized and operating under the provisions of the Revised School Code, MCLA 380.1 *et seq.*, as amended, whose address is 208 Clinton Street, Charlevoix, Michigan 49720 (the "School"). This Second Addendum also supplements the First Addendum to Sewage System Addition Agreement and is only between the City and the School. The Townships are not parties to this Second Addendum because the subject matter hereof relates only to rights and obligations relating to the City and the School. For purposes of this Second Addendum, the initial Agreement and the First Addendum shall be referred to as the "Previous Agreements".

AGREEMENT

NOW, THEREFORE, the parties, acting through their legally authorized representatives and in consideration of the mutual promises, contained in this Second Addendum to the Previous Agreements, agree as follows:

ARTICLE I (FIRST ADDENDUM)
INTRODUCTION

A. Purpose of Second Addendum. As described in the Previous Agreements, the City will construct sewer system improvements (the "Project") to serve the School's new high school site on Marion Center Road and the School will pay for the sewer system improvements. The City and the School have agreed to modifications in the construction of the sewer construction project and have identified those modifications as more specifically set forth below.

ARTICLE II (FIRST ADDENDUM)
PAYMENT OF COSTS

A. School's Responsibilities. The School's obligation to pay Project costs outlined in the Previous Agreements shall continue and any adjustment due to either the School or the City based on final project close out will be paid to the appropriate party within thirty (30) days of the final close out calculation. Article II of the First Addendum provides that the School's obligation to pay all costs shall also include the payment of all costs which the City is legally obligated to pay due to cancellation of the Project or due to increased Project costs caused by a delay in completion of the Project unless the delay is caused by an act or omission of the City. The Parties further agree that if the Project costs are less than initially estimated, the School will receive a credit within thirty (30) days of the final close out calculations.

ARTICLE III (INITIAL AGREEMENT)
PROJECT COSTS AND FUNDING

C. Primary Marion Center Construction. The Parties acknowledge that subsection C of Article III of the initial Agreement provides that the cost of constructing a sanitary sewer system along Marion Center Road connecting to the initial Marion Center system and extending to a point opposite the high school site is estimated to be $282,823.00 excluding associated engineering costs and other specified costs. The Parties acknowledge that these estimates were based on the assumption that an 8" sewer pipe would be used in the project. The Parties hereby agree that a 4" sewer pipe will be used instead of the 8" sewer pipe for approximately the last 1000' of the sewer leading to and terminating at a point opposite the high school site as more fully set forth in the engineering documents to be prepared by John Adams and Associates, Inc and that reimbursement amounts will be adjusted accordingly within thirty (30) days of the final close out calculations.

ARTICLE III (FIRST ADDENDUM)
OTHER AGREEMENT PROVISIONS

A. Rights and Obligations Unchanged. The rights and obligations of the parties in the Previous Agreements remain unchanged except to the extent that this Addendum clarifies, conflicts with, or delineates those rights and obligations. In the event of a conflict, this Second Addendum shall be controlling over the Previous Agreements.

ARTICLE VI (FIRST ADDENDUM)
MISCELLANEOUS

A. Severability. It is understood and agreed by the Parties hereto that if any part, term or provision of this Second Addendum is held to be illegal or in conflict with any law of the state or federal government by a court of competent jurisdiction, the validity of the remaining portions or provisions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if this Agreement did not contain the particular part, term or provision held to be invalid.

B. Entire Agreement. The Previous Agreements and this Second Addendum embody the whole agreement of the parties. There are no promises, terms, conditions or obligations other than those contained herein and the Previous Agreements and that the same shall supercede all previous communications, representations or agreements either verbal or written between the parties hereto.

C. Applicable Law. The Previous Agreements and this Second Addendum shall be construed and governed by the laws of the State of Michigan.

D. No Assignment. The Previous Agreements and this Second Addendum shall not be assignable without the written consent of all parties hereto, which consent shall not be unreasonably withhold.

E. Binding on Successors. The Previous Agreements and this Second Addendum shall enure to the benefit of the successors and assigns, if any, of the respective parties hereto.

F. Effective Date. This Second Addendum shall be effective upon the last of the parties to execute it.

G. Additional Documents. The parties shall execute such additional documents, such as with a bank, as are necessary to effectuate the terms of this Second Addendum.

H. Headings. Headings on the above paragraphs or sentences are intended for organizational purposes only. To the extent that there is a conflict between a heading and any text, the text shall govern.

I. Counterparts. This Second Addendum may be executed in one or more counterparts, including facsimile copies, each of which shall be deemed an original, but all of which shall together constitute one in the same instrument.

IN WITNESS WHEREOF, the parties by their authorized representatives have executed this Second Addendum to the Previous Agreements on the date set forth below.

CITY OF CHARLEVOIX

Date: 5-21-02

By: Alvin Russell
Alvin Russell
Its: Mayor

By: Elizabeth A. Gooch
Elizabeth A. Gooch
Its: Clerk

CHARLEVOIX PUBLIC SCHOOLS

Date: 5/21/02

By: John Sturock
Dr. John Sturock
Its: Superintendent of Schools

C:\LHS-MAIL\05300 Addendum.wpd, amended 5/20/02

SEWER CONNECTION AGREEMENT

THIS AGREEMENT is entered into to be effective the 15th day of July, 2004 between the City of Charlevoix, a Michigan municipal corporation, whose address is 210 State Street, Charlevoix, Michigan 49720 ("City") and Charlevoix Land Company, L.L.C., whose address is 618 South Creyts Rd., Suite B, Lansing, Michigan 48917 ("Property Owner").

Background

The Property Owner has constructed a motel development in Hayes Township. In June, 2002 the parties entered into a Privilege Fee Prepayment Contract in which the Property Owner prepaid the privilege fee for connection with the City sewer system based on 24.31 REUs. The Privilege Fee Prepayment Contract did not give the Property Owner the right to connect to the City's sewer system but left that decision in the sole discretion of the City. At the time of the City's execution of this Agreement, the Property Owner will have paid to the City a total of EIGHTY-FIVE THOUSAND EIGHTY-FIVE and 00/100 DOLLARS ($85,085.00) in privilege fees and connection fees. This Agreement is entered pursuant to the City of Charlevoix letter dated November 5, 2003, allowing the Property Owner to connect to the City sewer system under the terms and conditions of this Agreement.

Agreement

Therefore, in consideration of the mutual promises contained herein, the parties hereby agree as follows:

1. Connection Authority.

   The City hereby grants permission to the Property Owner to connect to the City sewer system under the terms and conditions of this Agreement.

2. Location and Nature of Connection.

   The Property Owner shall connect to the City sewer force main located within the U.S. 31 right-of-way through use of a force main and lift station constructed on the Property Owner's property as depicted in drawing C-02 and as specified in drawing D-01 attached hereto and incorporated by referenced as Exhibits "A" and "B".

3. Temporary Connection.

   The connection authorized under this Agreement shall be temporary and shall cease when a gravity sewer main to service the property is provided from the Lange property (parcel no. 15-007-119-006-30) and extended to Property Owners' property line. The Property Owner shall bear all costs associated with disconnecting the force main and lift station from the City sewer line located within the U.S. 31 right-of-way and connection to the new gravity sewer main.

4. Maintenance of Force Main and Lift Station

The Property Owner shall be responsible for and shall bear all expenses associated with maintaining the force main and lift station located on its property.

5. Upgrading Lift Station

The Property Owner hereby agrees that the lift station constructed on its property shall be capable of being retrofitted for larger capacity pumps in the event that the City authorizes other developments to be serviced by the force main on Property Owner's property prior to the installation of a gravity sewer line. The Property Owner shall upgrade the lift station to the City's specifications, at its sole expense, within ninety (90) days of written notice by the City of the need to upgrade the lift station.

6. Letter of Credit.

The Property Owner shall provide for the benefit of the City an irrevocable letter of credit acceptable to the City in the amount of not less than NINE THOUSAND and 00/100 DOLLARS ($9,000.00) to ensure proper construction of the lift station upgrade as required in paragraph 6 above. This irrevocable letter of credit shall be maintained until the lift station is upgraded as provided in paragraph 6 above or the property is serviced by a gravity sewer as provided in paragraph 4 above.

IN WITNESS WHEREOF, the parties have executed this Agreement to be effective on the date first above written.

CITY OF CHARLEVOIX

Dated: 8/10/04

By: Gabe Campbell
Gabe Campbell
Its: Mayor

By: Carol A. Ochs
Carol A. Ochs
Its: Clerk

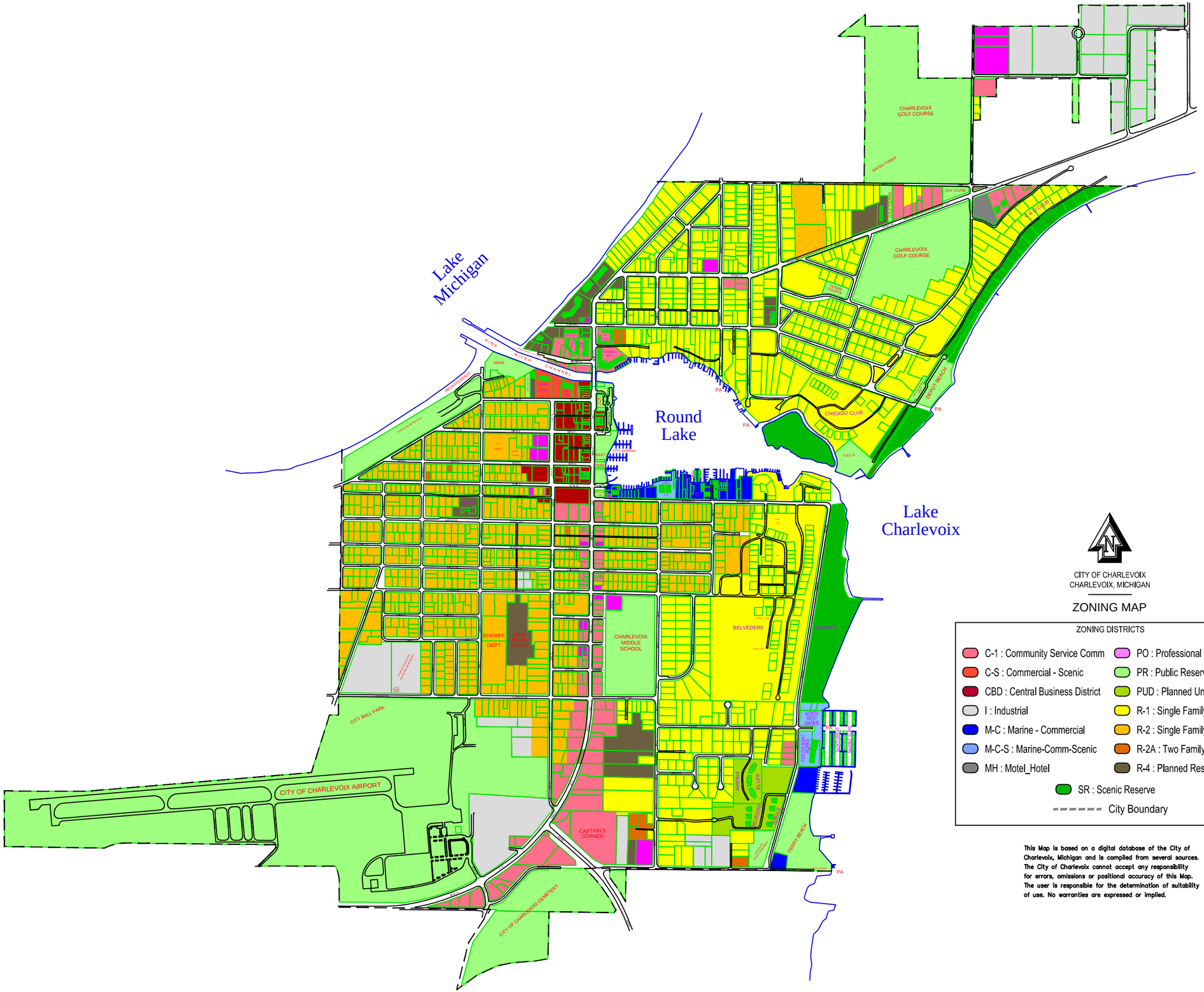
CHARLEVOIX LAND COMPANY, L.L.C.

Dated: _____

By: _____
David J. Haywood
Its: Member

Appendix C

Zoning Maps



CITY OF CHARLEVOIX
CHARLEVOIX, MICHIGAN

ZONING MAP

ZONING DISTRICTS

- C-1 : Community Service Comm
- C-S : Commercial - Scenic
- CBD : Central Business District
- I : Industrial
- M-C : Marine - Commercial
- M-C-S : Marine-Comm-Scenic
- MH : Motel_Hotel
- PO : Professional Office
- PR : Public Reserve
- PUD : Planned Unit Development
- R-1 : Single Family Residential
- R-2 : Single Family Residential
- R-2A : Two Family Residential
- R-4 : Planned Residential
- SR : Scenic Reserve
- City Boundary

This Map is based on a digital database of the City of Charlevoix, Michigan and is compiled from several sources. The City of Charlevoix cannot accept any responsibility for errors, omissions or positional accuracy of this Map. The user is responsible for the determination of suitability of use. No warranties are expressed or implied.

CITY OF CHARLEVOIX
210 STATE ST.
CHARLEVOIX, MICH. 49720
PLANNING AND ZONING
(231) 547-3265
FAX (231) 547-3617

Date: 1-30-12
Drawn By: DJH
Scale: 1" = 1200'
Checked By: DJH

Sheet Title: City of Charlevoix ZONING MAP CHARLEVOIX, MICHIGAN

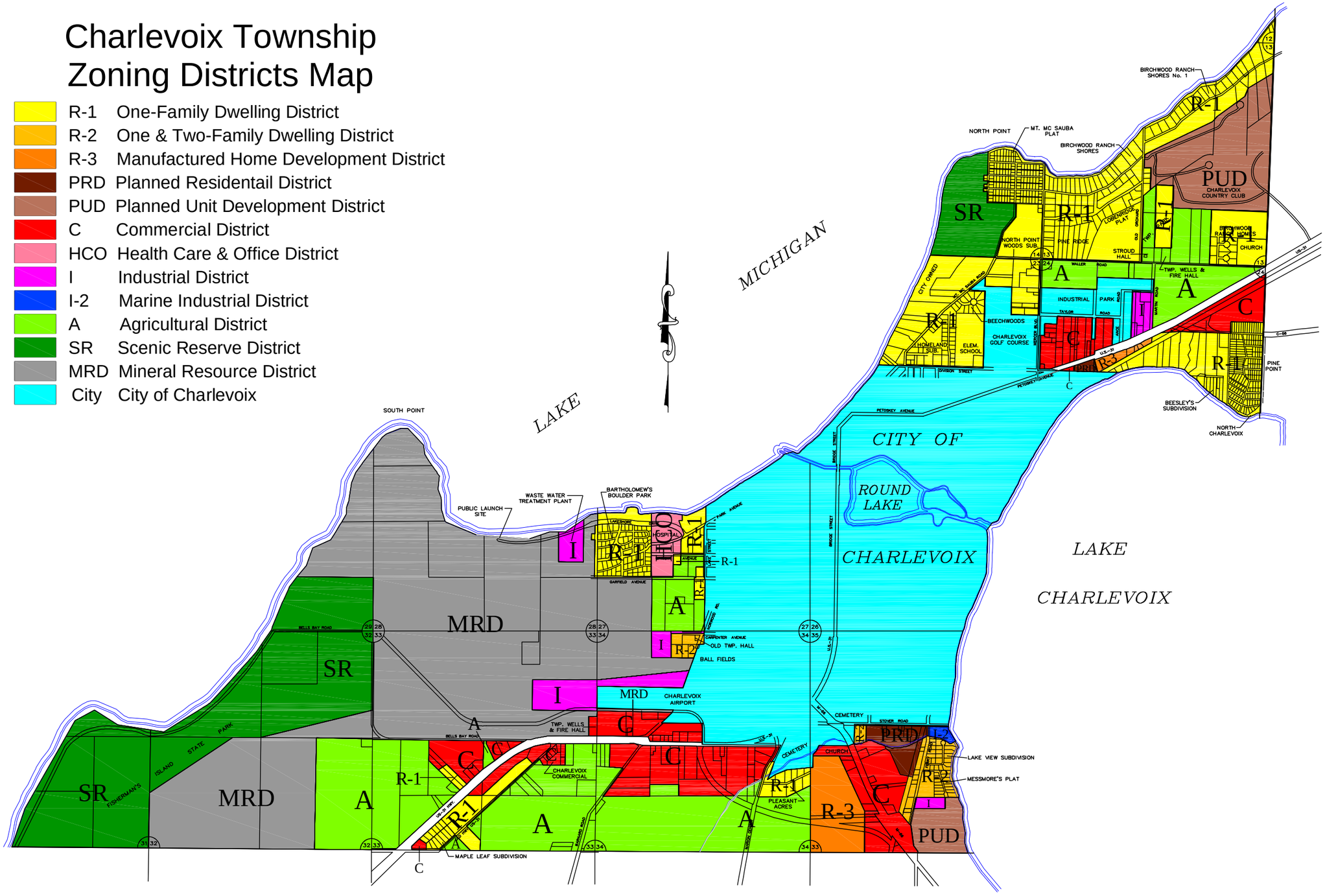
Project:

Project No. 1

Sheet 1 of 1

Charlevoix Township Zoning Districts Map

- R-1 One-Family Dwelling District
- R-2 One & Two-Family Dwelling District
- R-3 Manufactured Home Development District
- PRD Planned Residentail District
- PUD Planned Unit Development District
- C Commercial District
- HCO Health Care & Office District
- I Industrial District
- I-2 Marine Industrial District
- A Agricultural District
- SR Scenic Reserve District
- MRD Mineral Resource District
- City City of Charlevoix



SCALE 1" = 1000'
0' 1000' 2000'

Gosling Czubak engineering sciences, inc.
Engineers · Surveyors · Planners · Environmental Services
Traverse City, MI 49685-0637
1999 Bryant Street, Suite 900
Tel: 231-941-1925 Fax: 231-941-1963

No.:	Date:	Revision:	By:
1.	09/19/03	Revisions per Township	JH
2.	04/19/04	Revisions per Township	JH

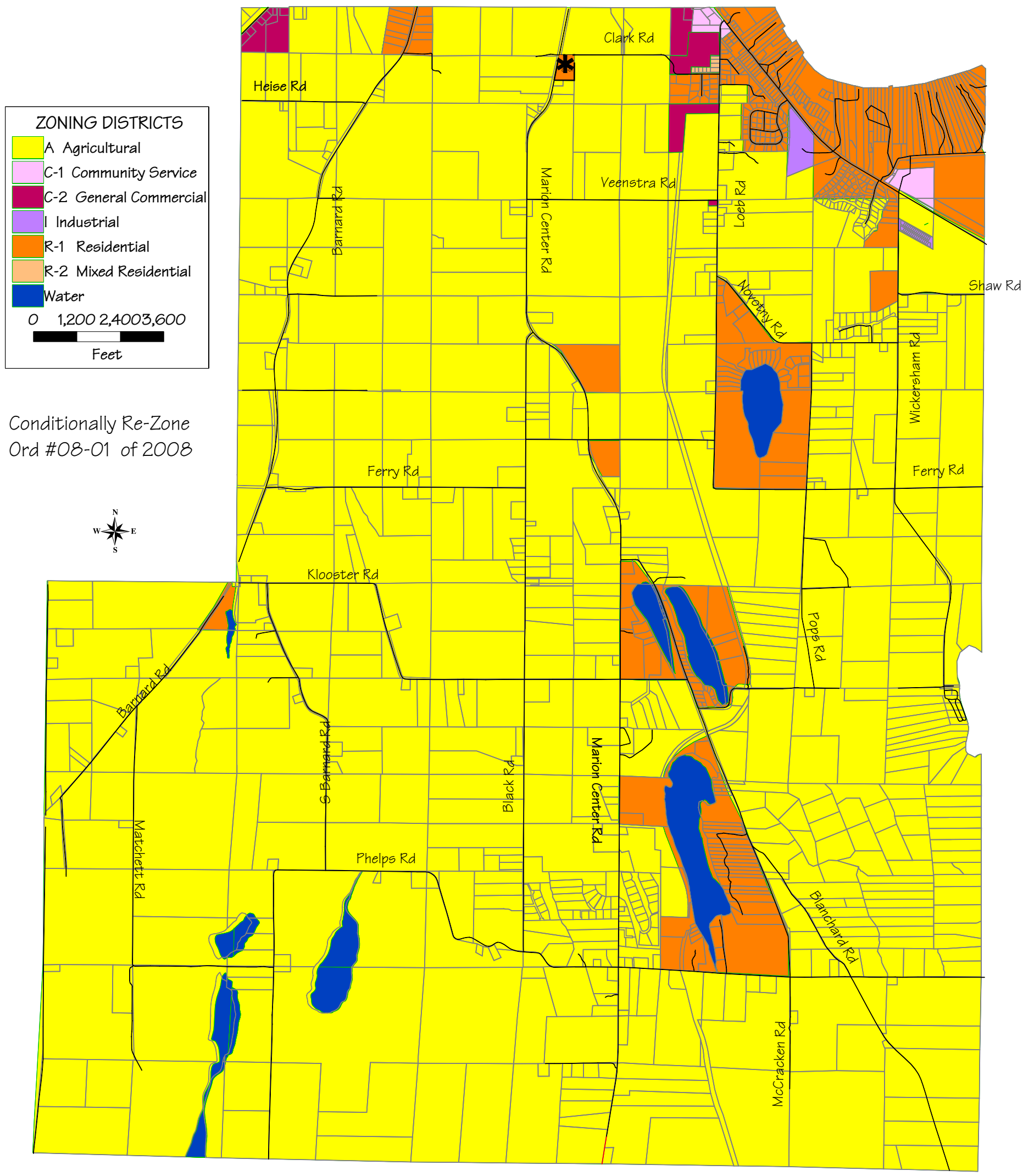
Date: 11/07/2002
Scale: AS NOTED
Drawn By: JH
Checked By: FLH

Location: CHARLEVOIX TOWNSHIP, CHARLEVOIX COUNTY, MICHIGAN

Sheet Title: Zoning Districts Map Charlevoix Township
Client:

Project No. 2000425.01
Sheet 1 of 1

MARION TOWNSHIP ZONING MAP



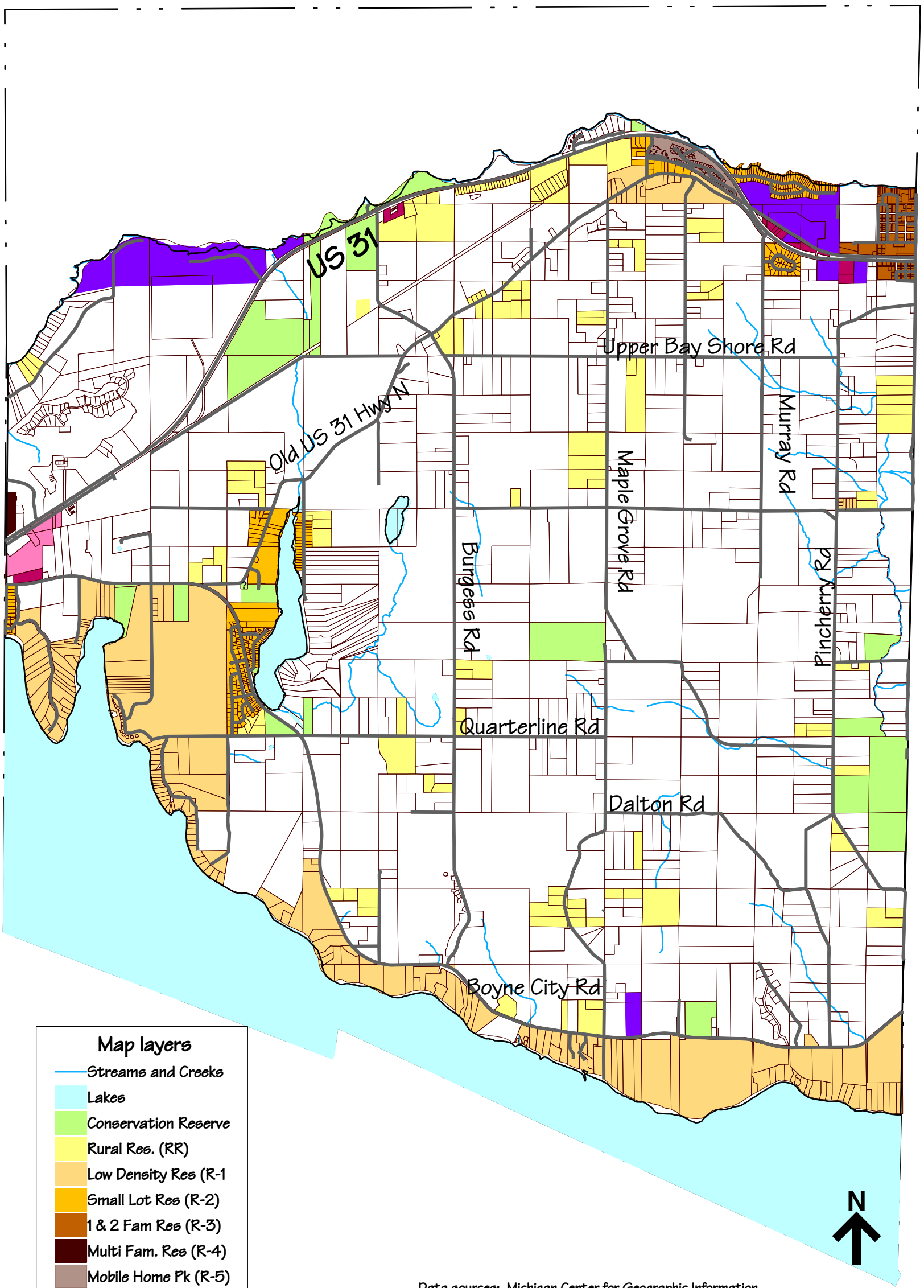
Adopted January 17, 2005

Effective: February 2, 2005

As amended through March 2008

HAYES TOWNSHIP ZONING MAP

Charlevoix County, Michigan



Map layers

- Streams and Creeks
- Lakes
- Conservation Reserve
- Rural Res. (RR)
- Low Density Res (R-1
- Small Lot Res (R-2)
- 1 & 2 Fam Res (R-3)
- Multi Fam. Res (R-4)
- Mobile Home Pk (R-5)
- Neighborhood Comm
- Gen Commercial (C-2)
- Gen Industrial (I-1)
- Agricultural (A)
- Roads

0 2,000 4,000 6,000

Feet

Data sources: Michigan Center for Geographic Information, Charlevoix County GIS Department, and Hayes Township.

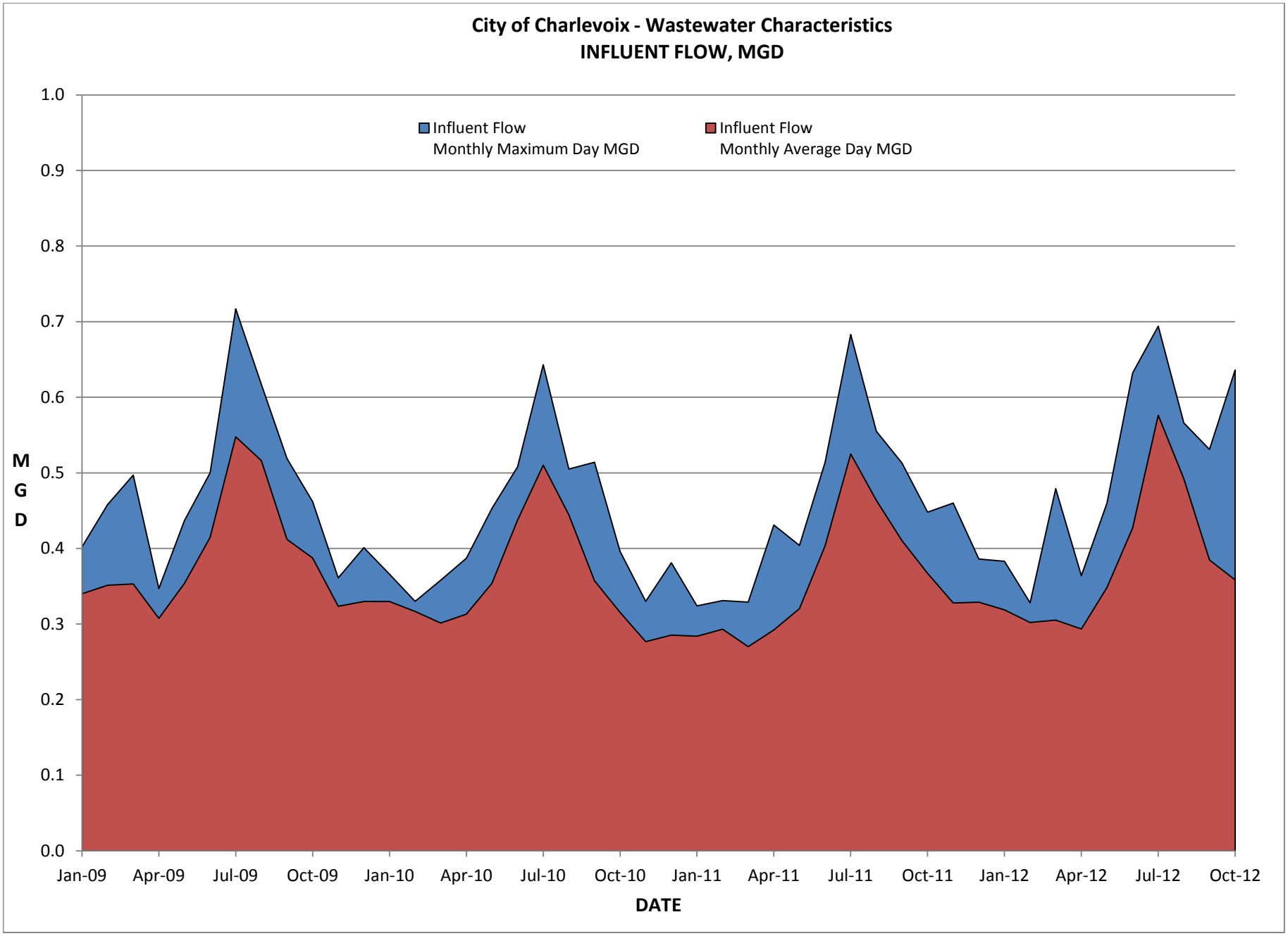
Map Prepared by: M.C. Planning & Design

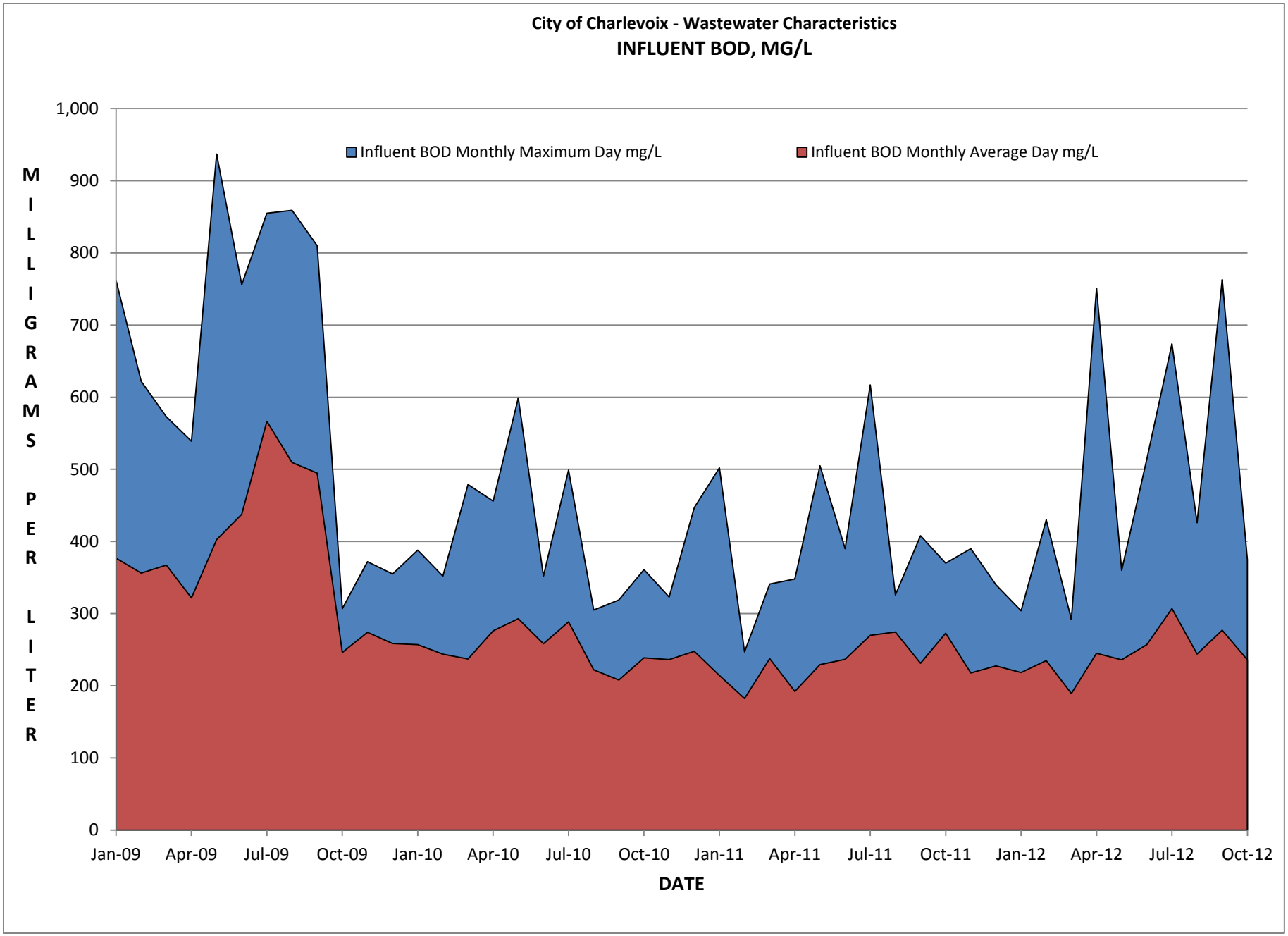
Adopted: October 12, 2009

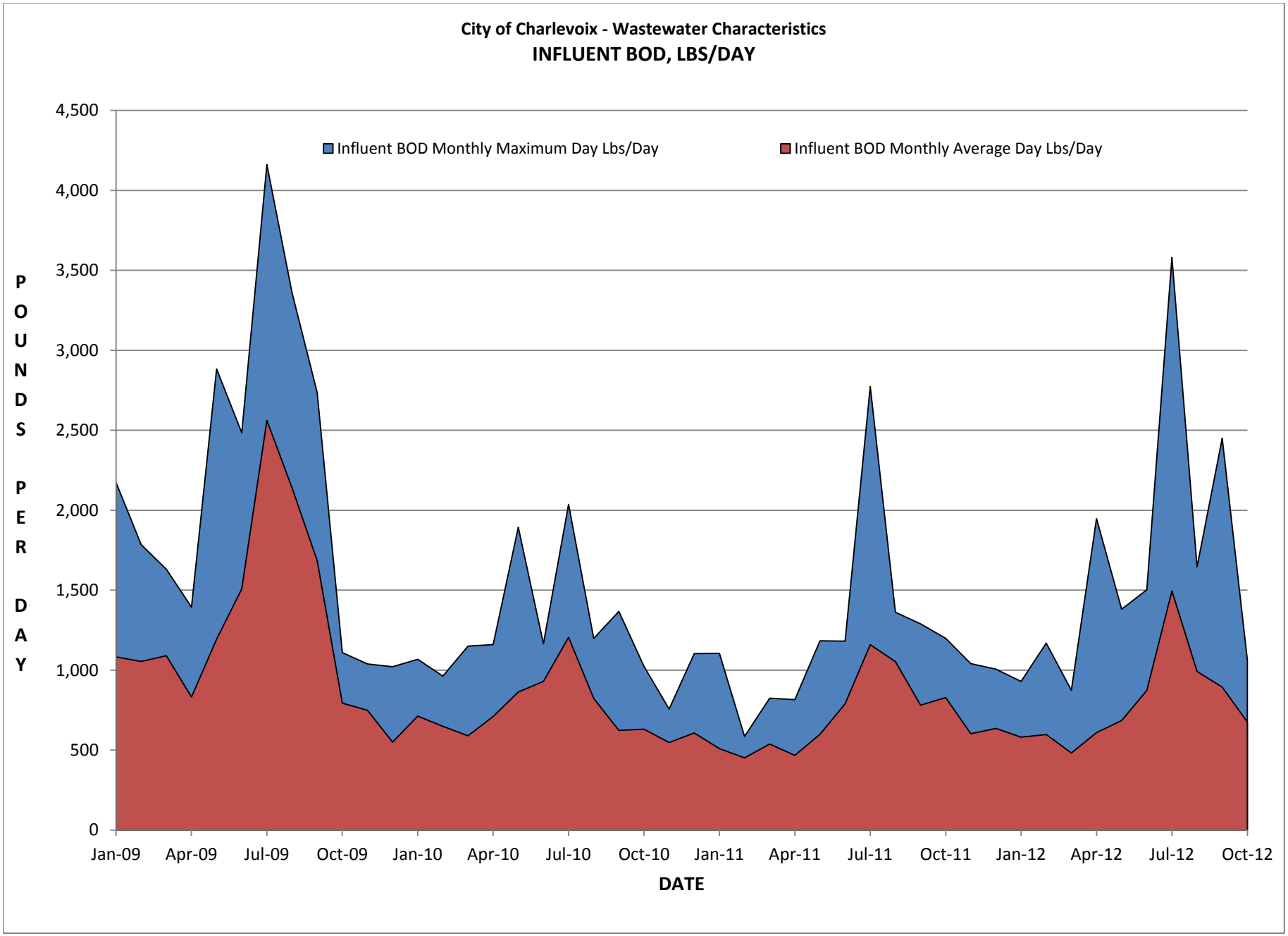
Effective: October 31, 2009

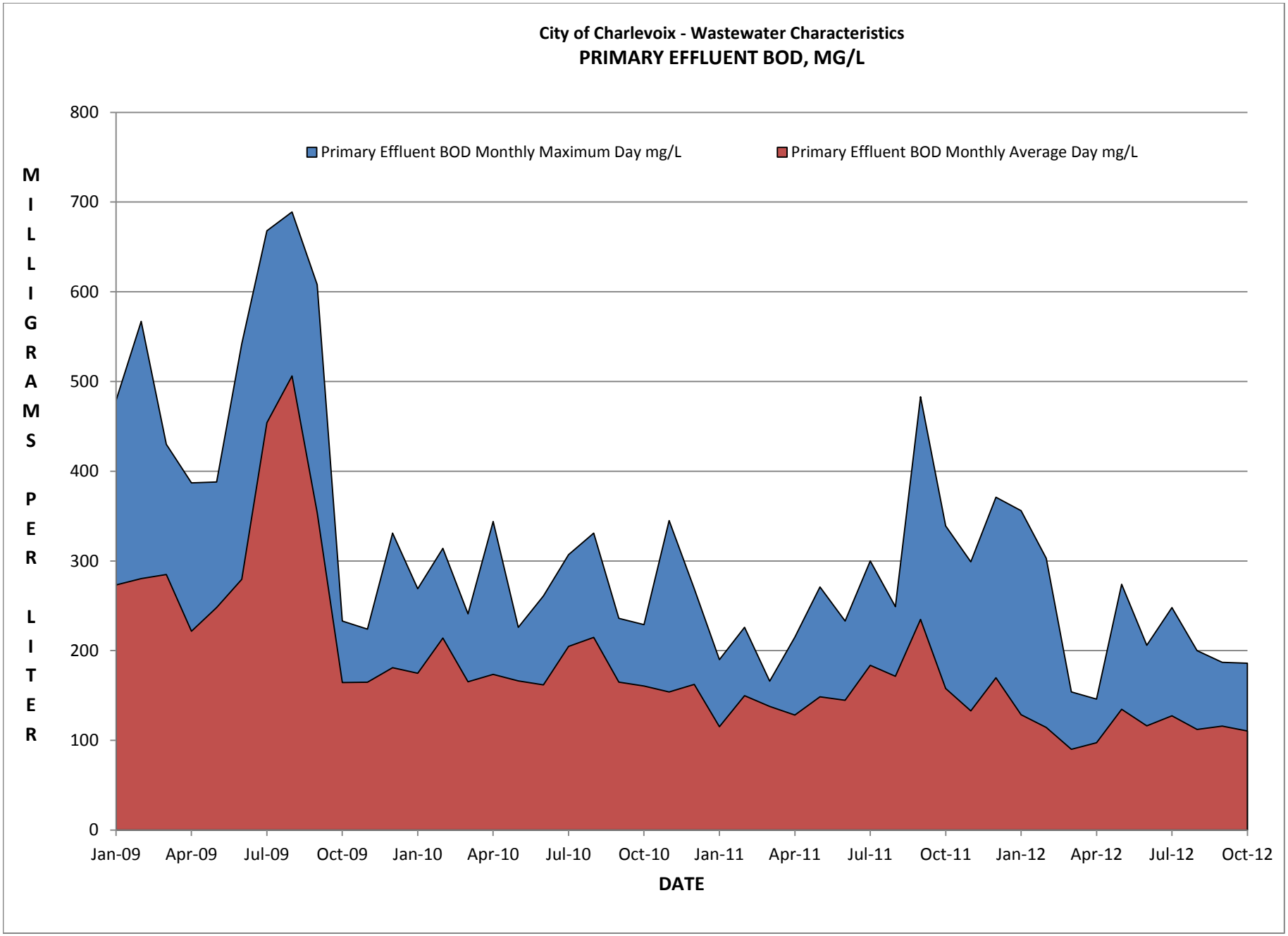
Appendix D

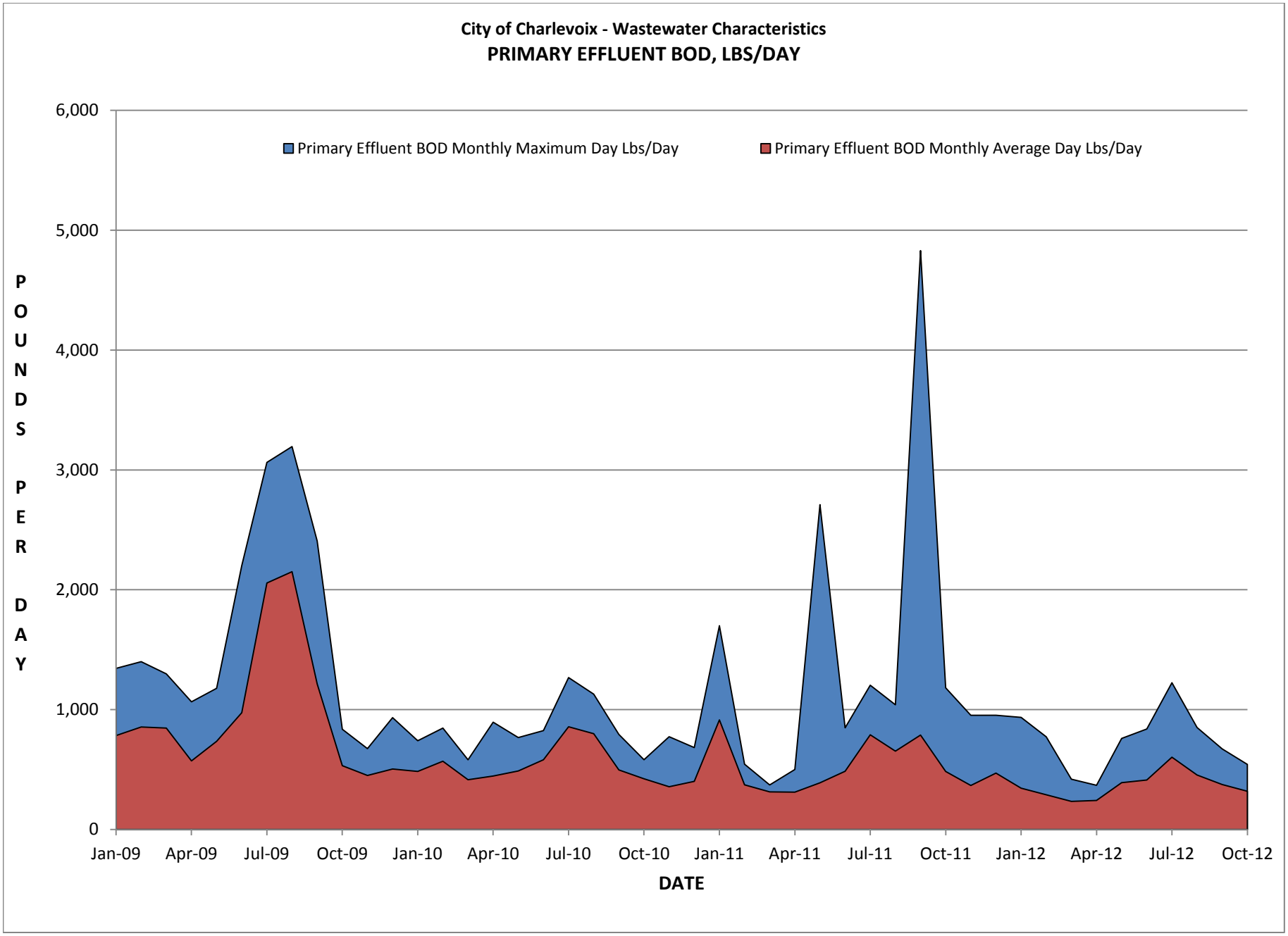
Wastewater Characteristics


City of Charlevoix - Wastewater Characteristics
INFLUENT FLOW, MGD
Influent Flow
Monthly Maximum Day MGD
Influent Flow
Monthly Average Day MGD
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
MGD
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Apr-11
Jul-11
Oct-11
Jan-12
Apr-12
Jul-12
Oct-12
DATE


City of Charlevoix - Wastewater Characteristics
INFLUENT BOD, MG/L
Influent BOD Monthly Maximum Day mg/L
Influent BOD Monthly Average Day mg/L
MILLIGRAMS PER LITER
1,000
900
800
700
600
500
400
300
200
100
0
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Apr-11
Jul-11
Oct-11
Jan-12
Apr-12
Jul-12
Oct-12
DATE


City of Charlevoix - Wastewater Characteristics
INFLUENT BOD, LBS/DAY
Influent BOD Monthly Maximum Day Lbs/Day
Influent BOD Monthly Average Day Lbs/Day
POUNDS PER DAY
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Apr-11
Jul-11
Oct-11
Jan-12
Apr-12
Jul-12
Oct-12
DATE


City of Charlevoix - Wastewater Characteristics
PRIMARY EFFLUENT BOD, MG/L
Primary Effluent BOD Monthly Maximum Day mg/L
Primary Effluent BOD Monthly Average Day mg/L
MILLIGRAMS PER LITER
800
700
600
500
400
300
200
100
0
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Apr-11
Jul-11
Oct-11
Jan-12
Apr-12
Jul-12
Oct-12
DATE


City of Charlevoix - Wastewater Characteristics
PRIMARY EFFLUENT BOD, LBS/DAY
Primary Effluent BOD Monthly Maximum Day Lbs/Day
Primary Effluent BOD Monthly Average Day Lbs/Day
POUNDS PER DAY
6,000
5,000
4,000
3,000
2,000
1,000
0
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
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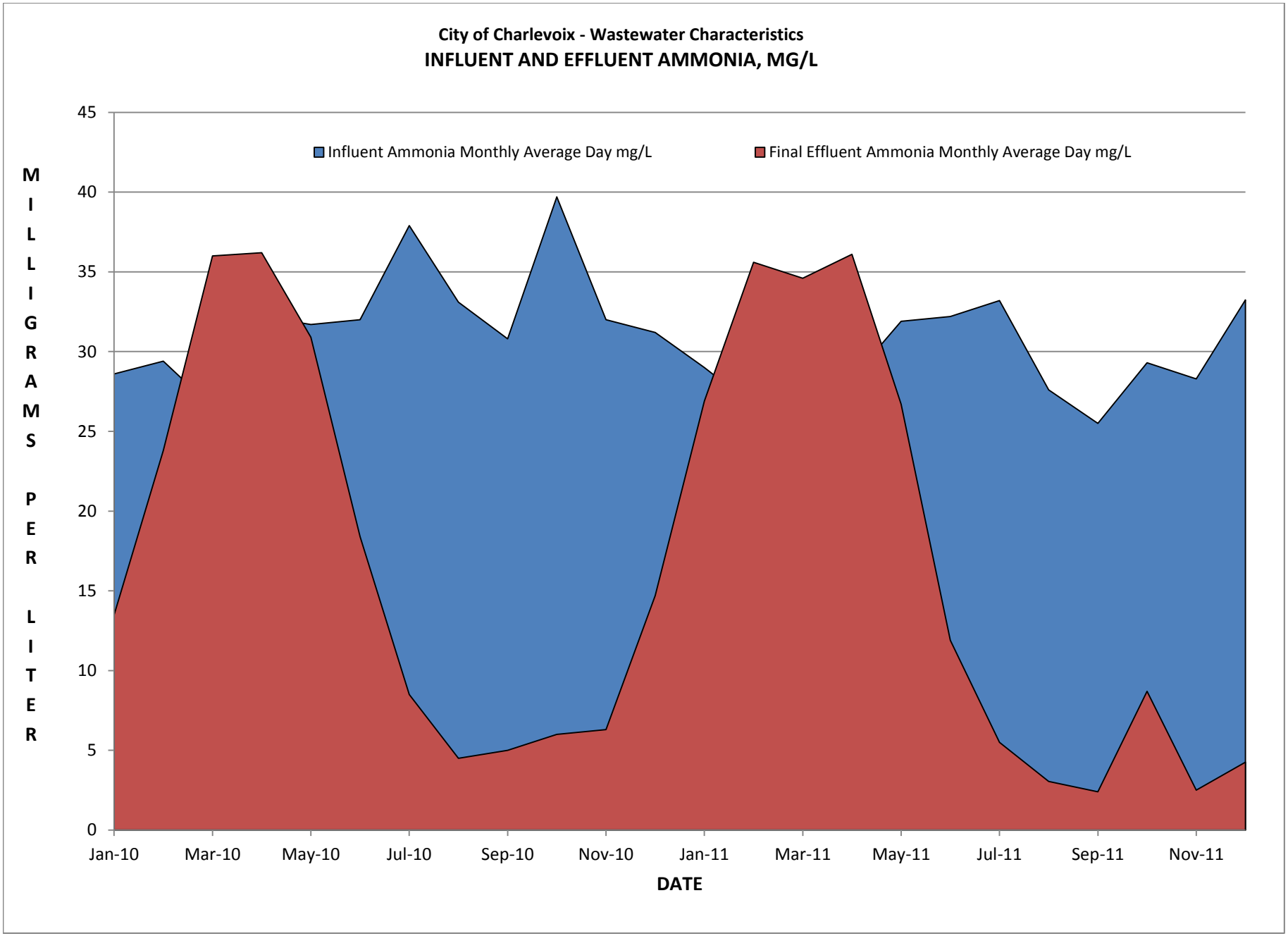
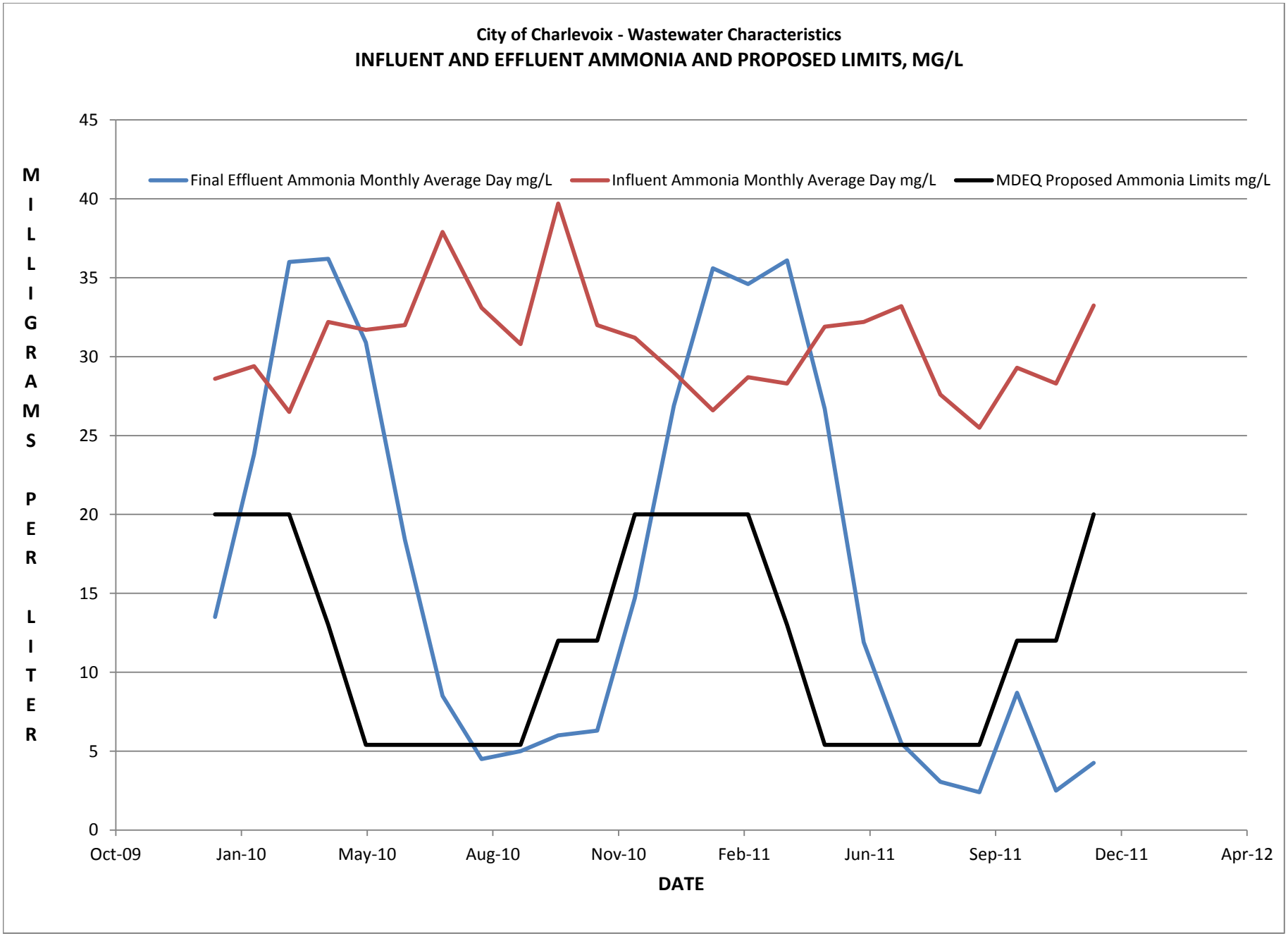
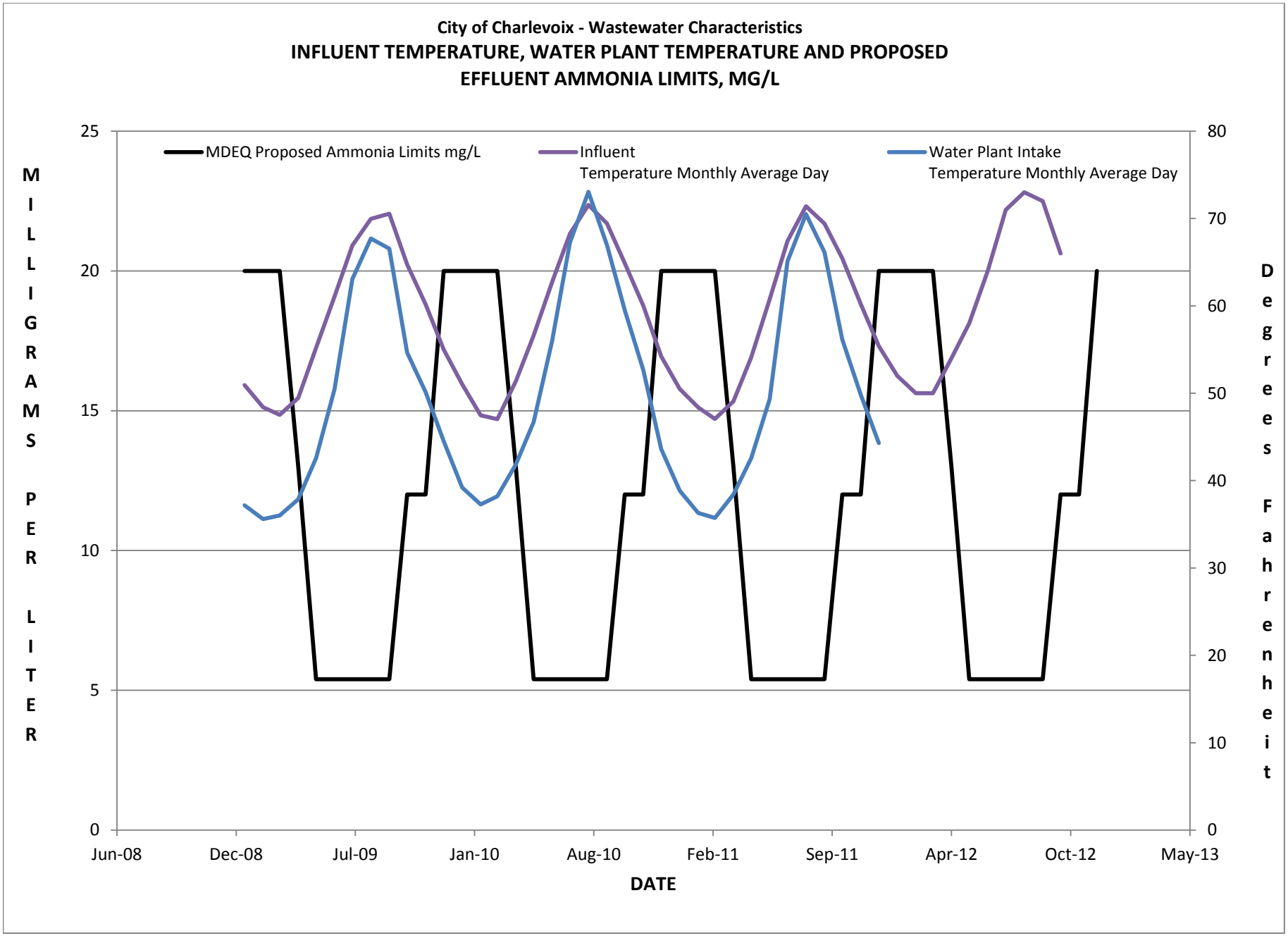
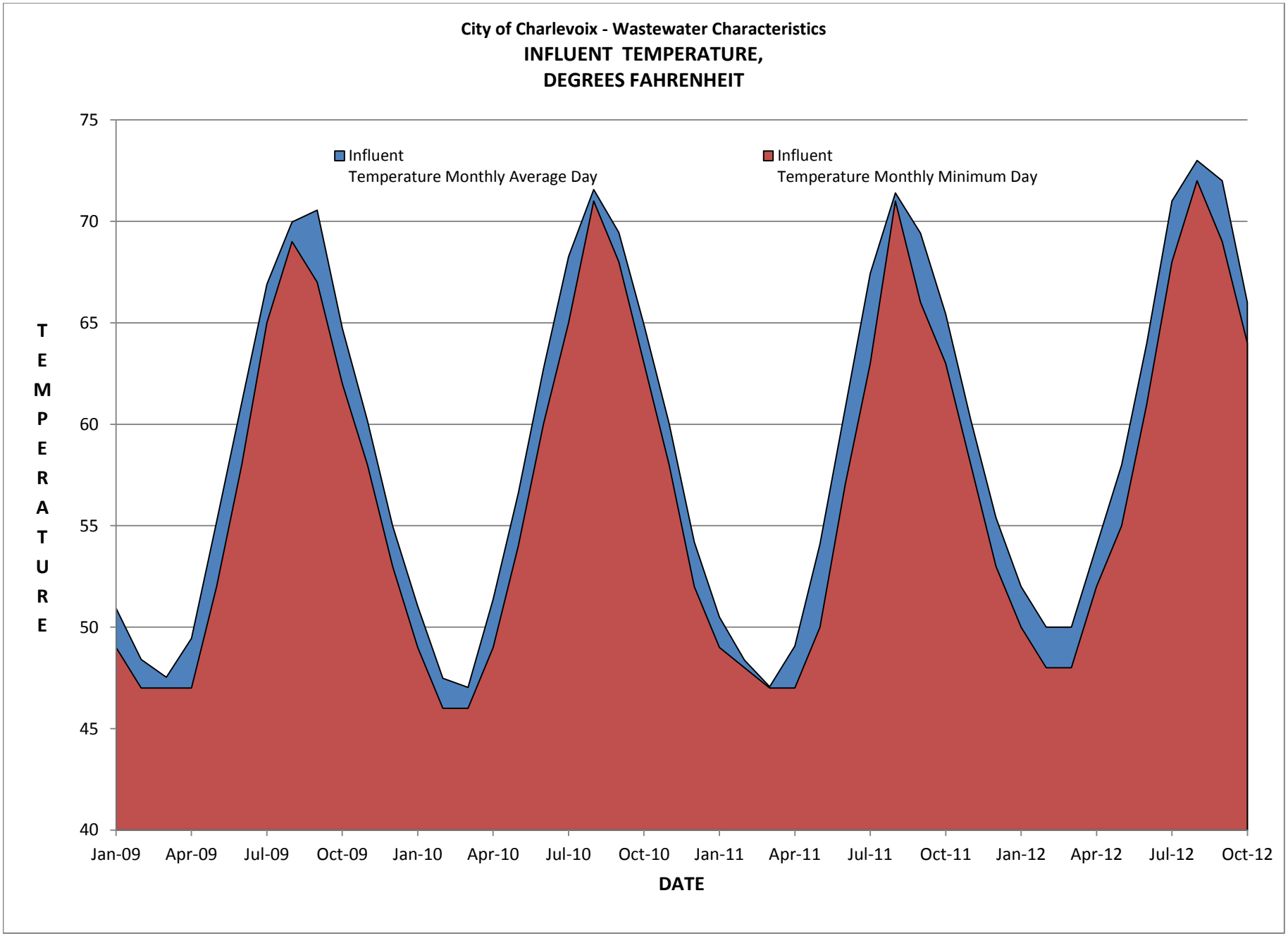
Oct-10
Jan-11
Apr-11
Jul-11
Oct-11
Jan-12
Apr-12
Jul-12
Oct-12
DATE


City of Charlevoix - Wastewater Characteristics
INFLUENT AND EFFLUENT AMMONIA, MG/L
Influent Ammonia Monthly Average Day mg/L
Final Effluent Ammonia Monthly Average Day mg/L
MILLIGRAMS PER LITER
45
40
35
30
25
20
15
10
5
0
Jan-10
Mar-10
May-10
Jul-10
Sep-10
Nov-10
Jan-11
Mar-11
May-11
Jul-11
Sep-11
Nov-11
DATE


City of Charlevoix - Wastewater Characteristics
INFLUENT AND EFFLUENT AMMONIA AND PROPOSED LIMITS, MG/L
Final Effluent Ammonia Monthly Average Day mg/L
Influent Ammonia Monthly Average Day mg/L
MDEQ Proposed Ammonia Limits mg/L
MILLIGRAMS PER LITER
45
40
35
30
25
20
15
10
5
0
Oct-09
Jan-10
May-10
Aug-10
Nov-10
Feb-11
Jun-11
Sep-11
Dec-11
Apr-12
DATE


City of Charlevoix - Wastewater Characteristics
INFLUENT TEMPERATURE, WATER PLANT TEMPERATURE AND PROPOSED EFFLUENT AMMONIA LIMITS, MG/L
MDEQ Proposed Ammonia Limits mg/L
Influent Temperature Monthly Average Day
Water Plant Intake Temperature Monthly Average Day
MILLIGRAMS PER LITER
Degrees Fahrenheit
25
20
15
10
5
0
80
70
60
50
40
30
20
10
0
Jun-08
Dec-08
Jul-09
Jan-10
Aug-10
Feb-11
Sep-11
Apr-12
Oct-12
May-13
DATE


City of Charlevoix - Wastewater Characteristics
INFLUENT TEMPERATURE,
DEGREES FAHRENHEIT
Influent
Temperature Monthly Average Day
Influent
Temperature Monthly Minimum Day
TEMPERATURE
75
70
65
60
55
50
45
40
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
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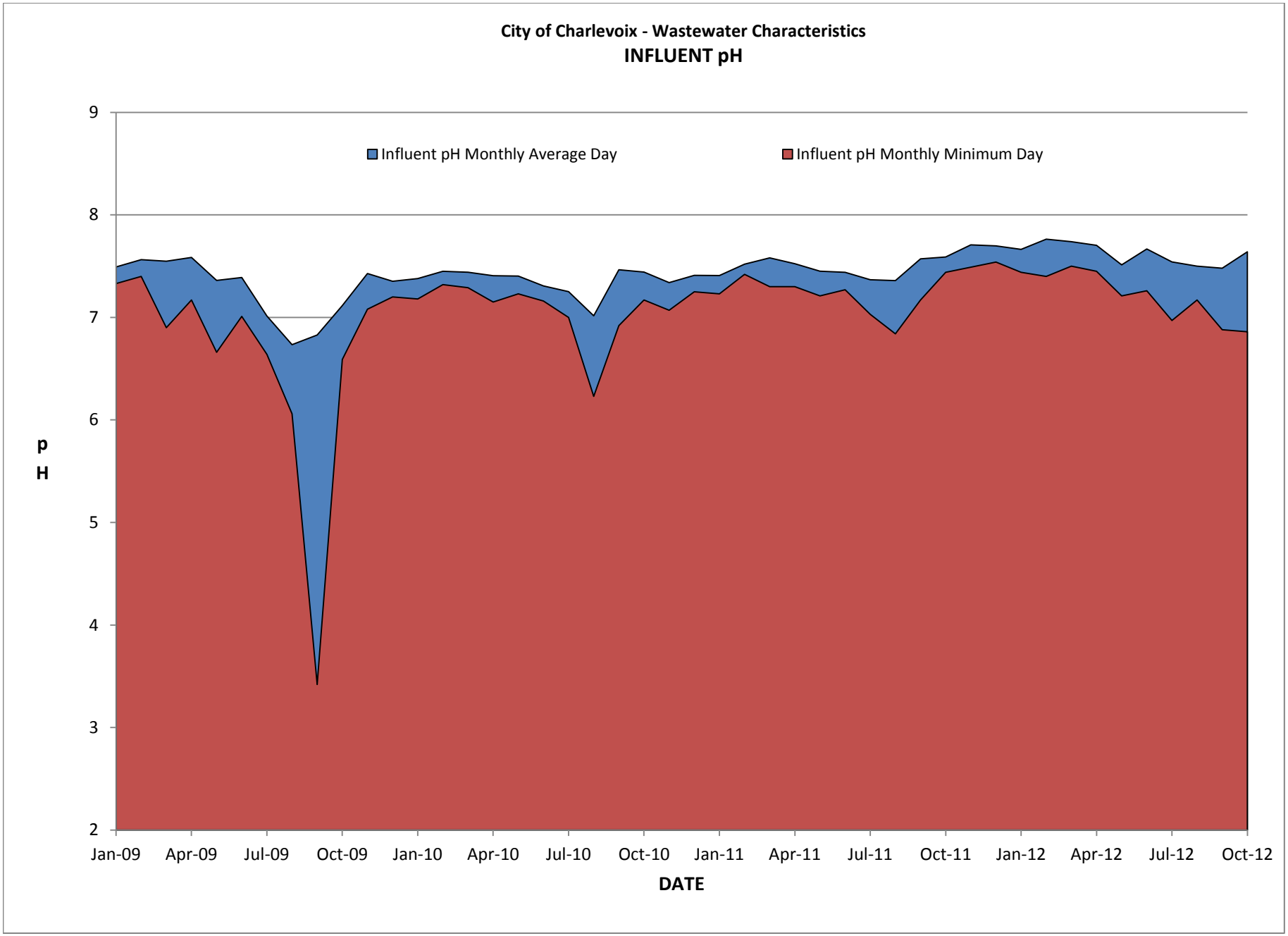
Apr-12
Jul-12
Oct-12
DATE


City of Charlevoix - Wastewater Characteristics
INFLUENT pH
Influent pH Monthly Average Day
Influent pH Monthly Minimum Day
9
8
7
6
5
4
3
2
pH
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
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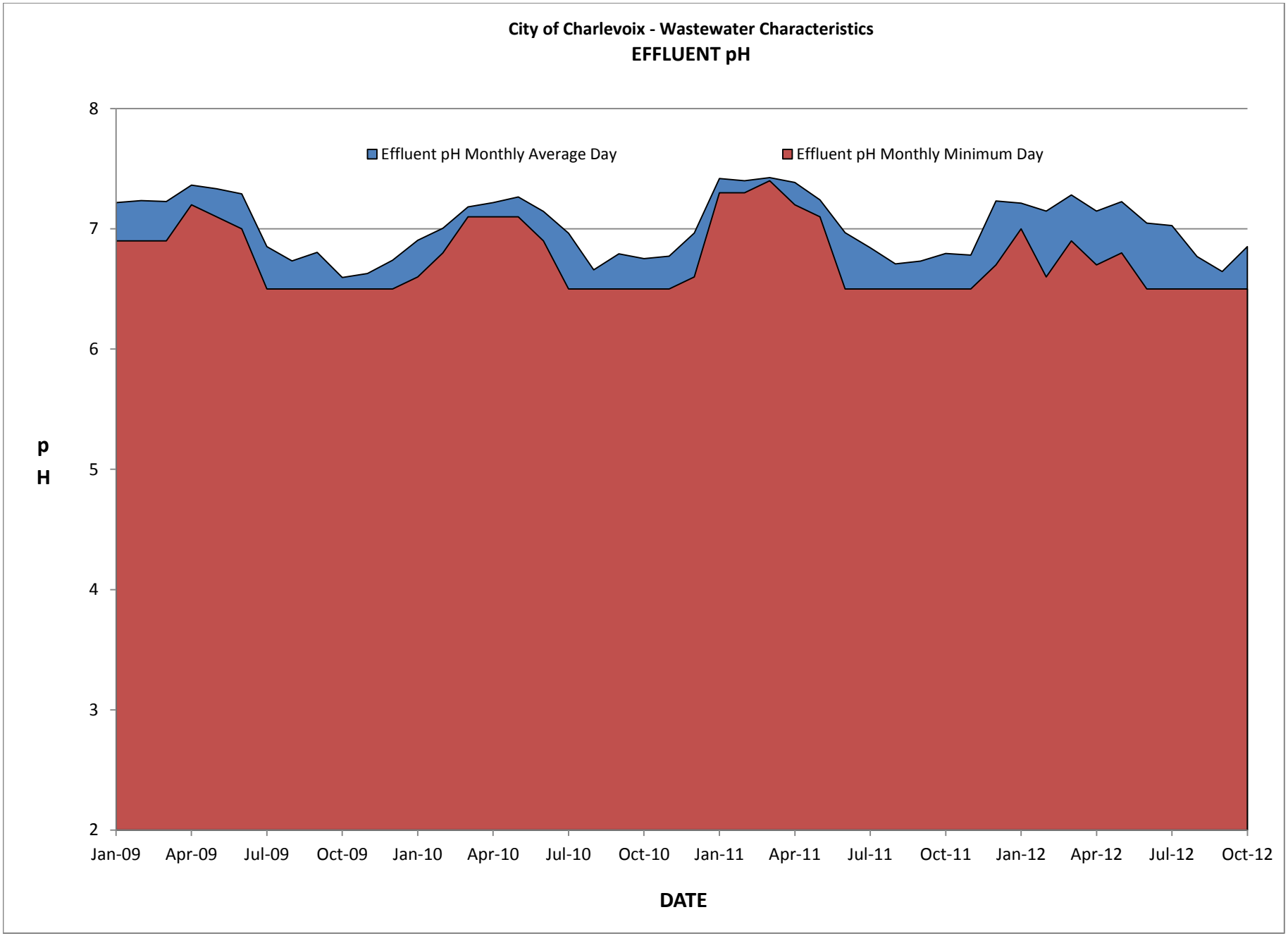
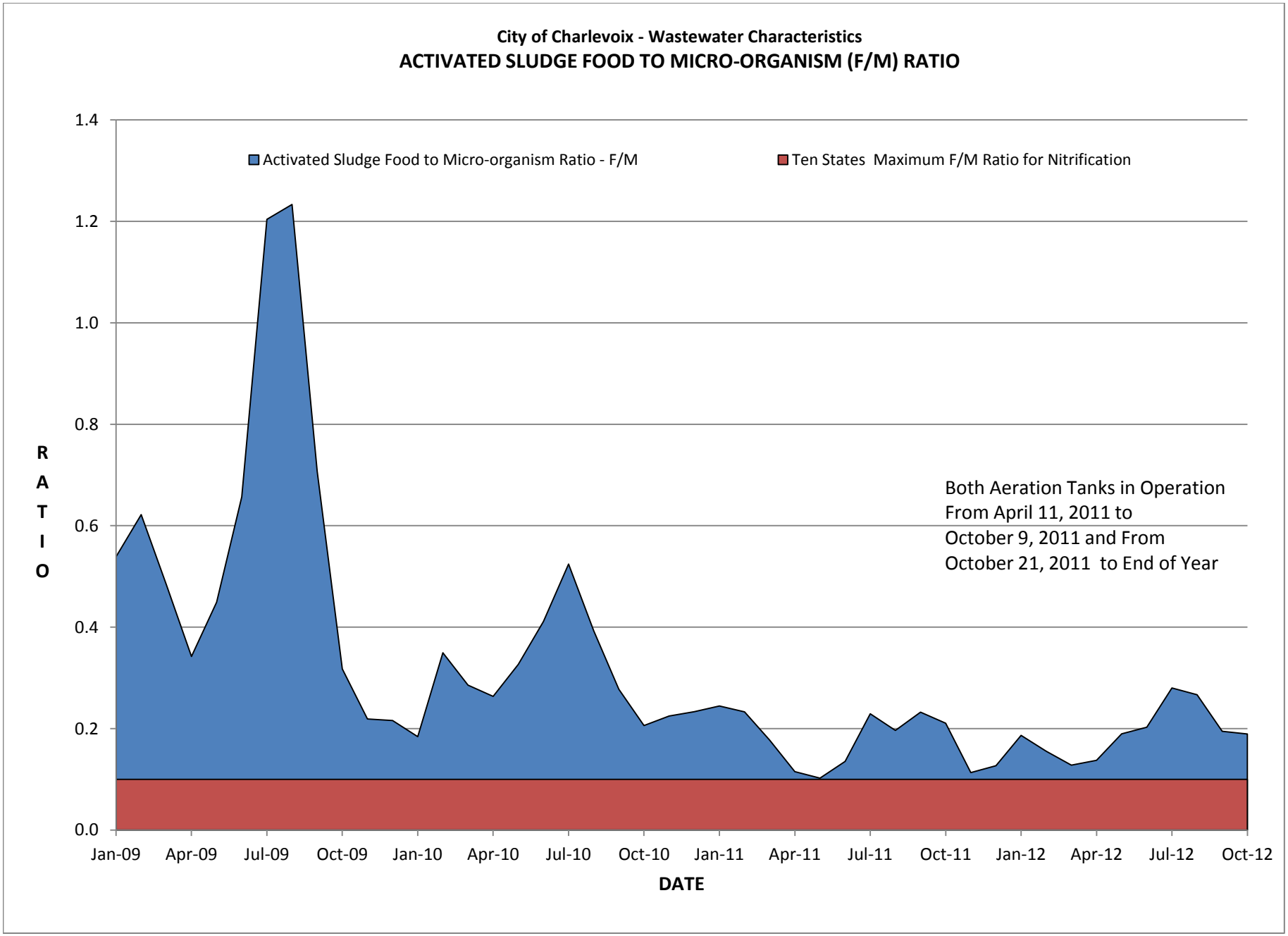
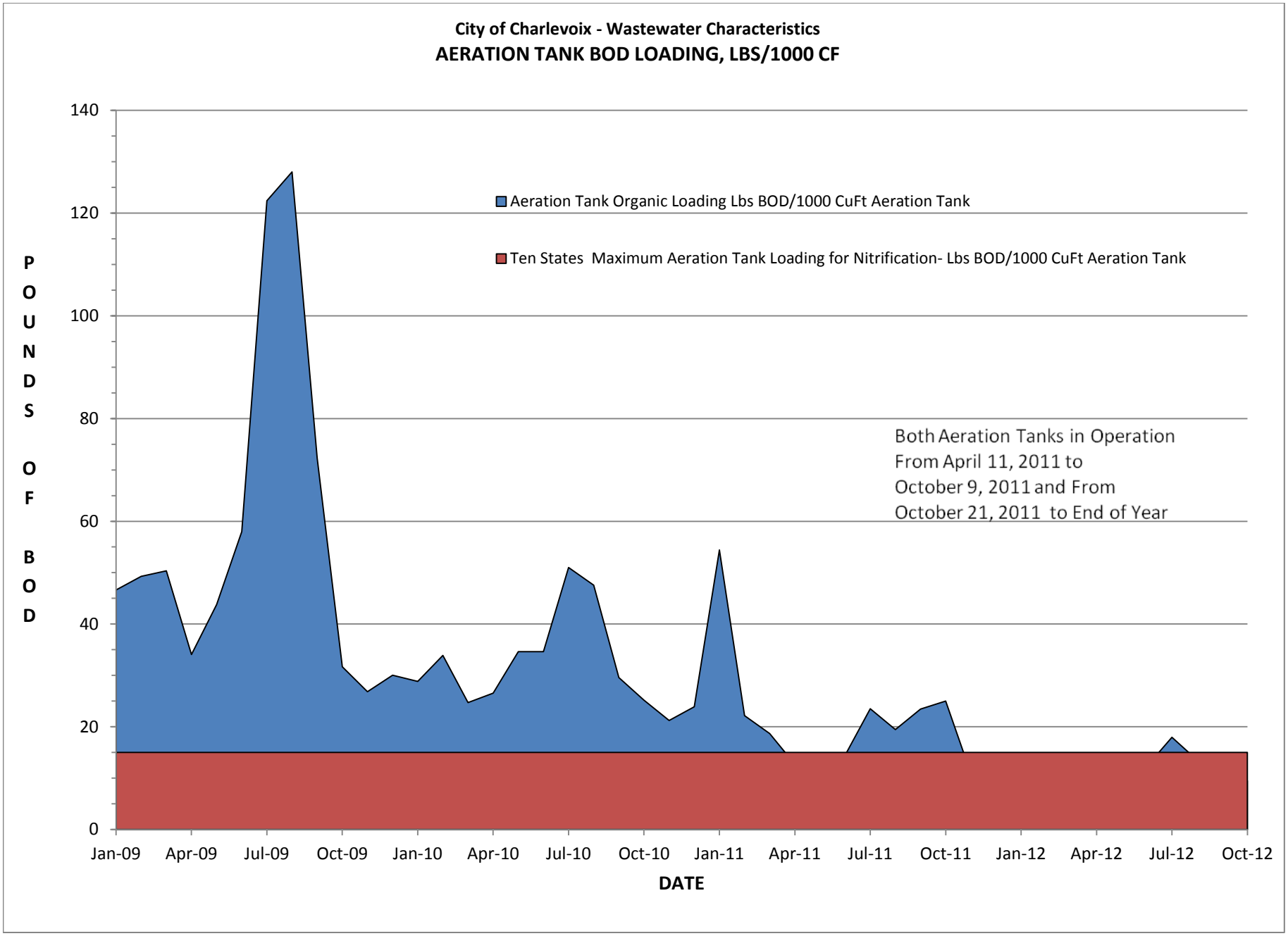
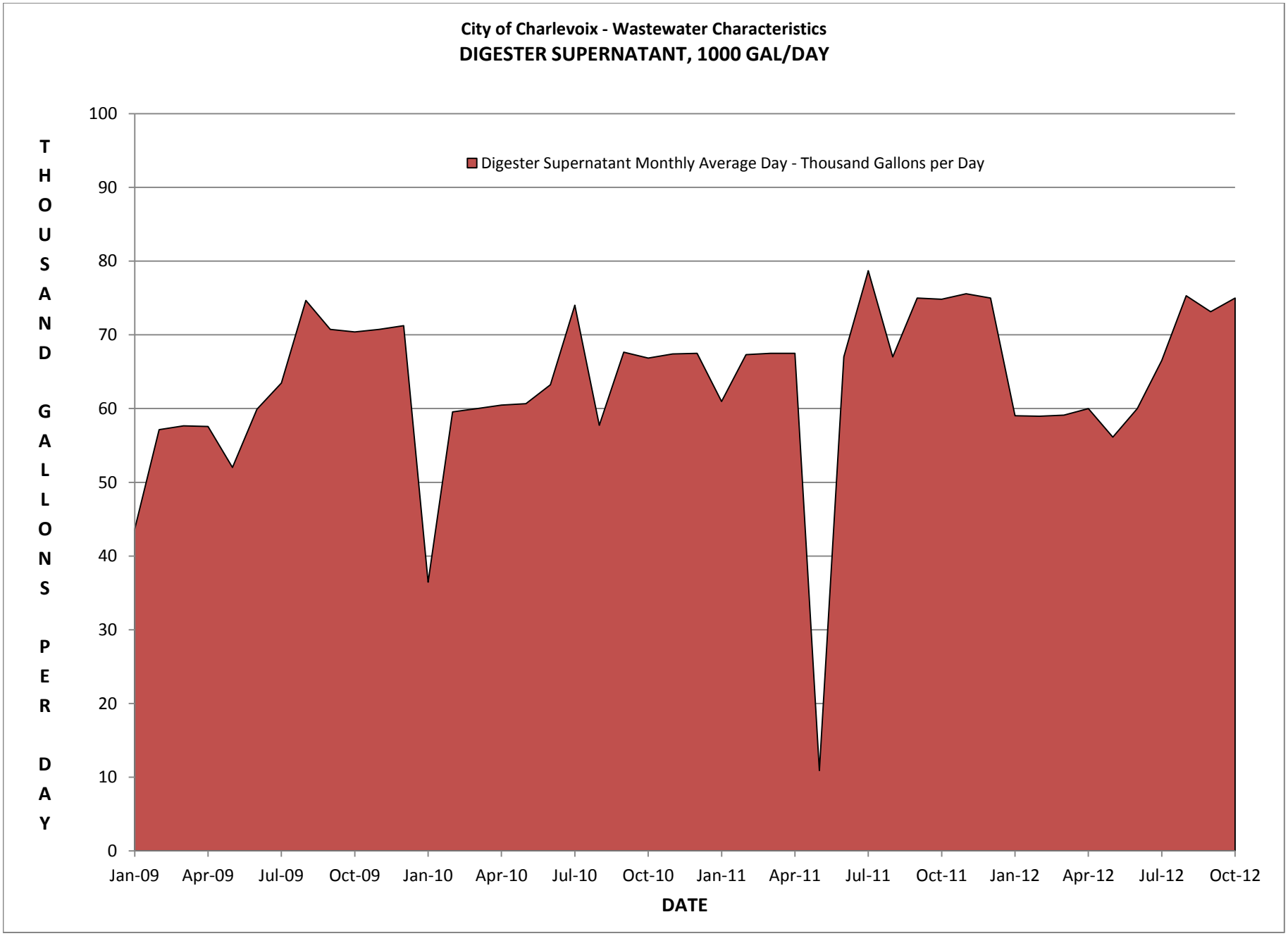
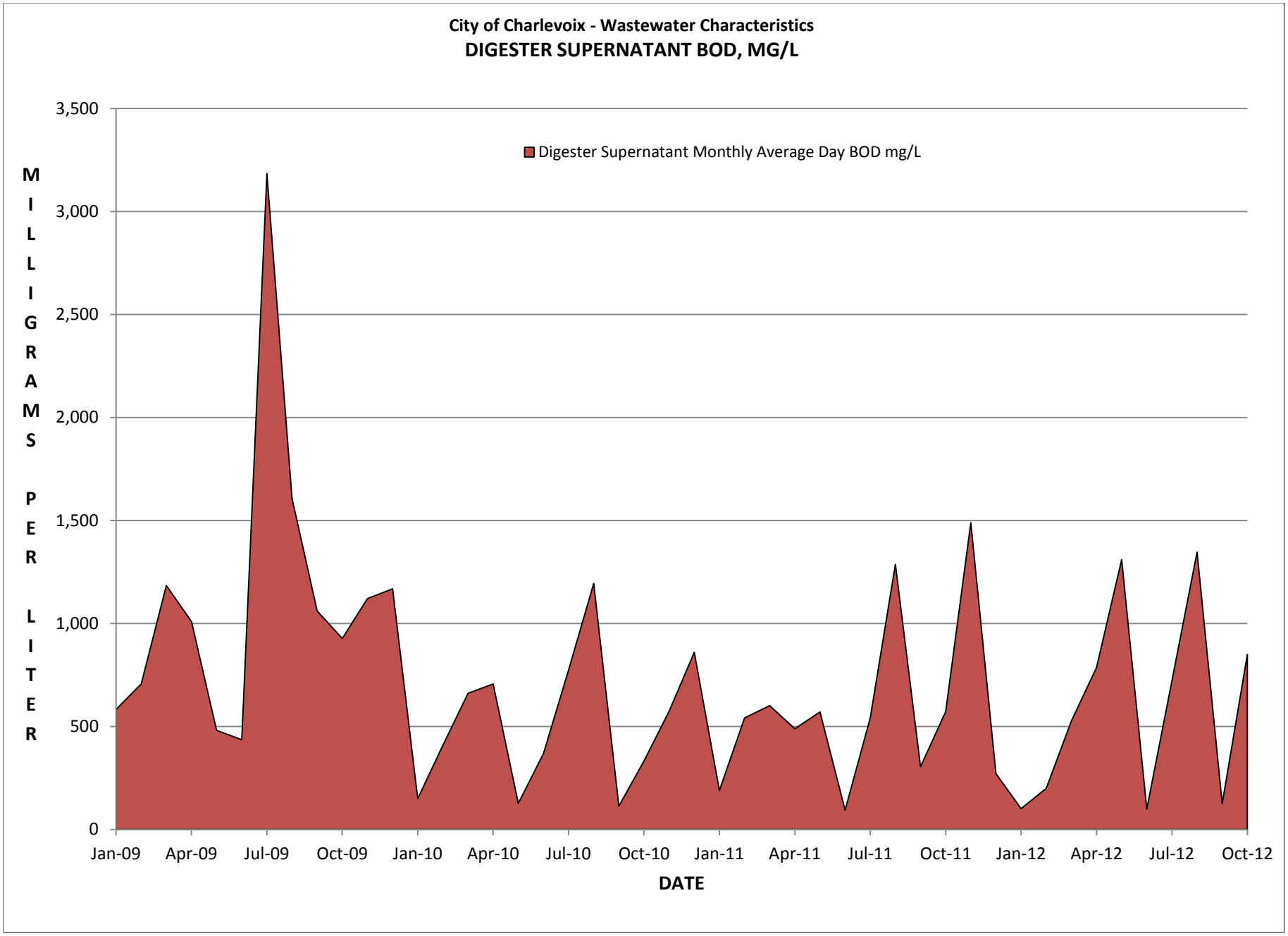
Apr-12
Jul-12
Oct-12
DATE

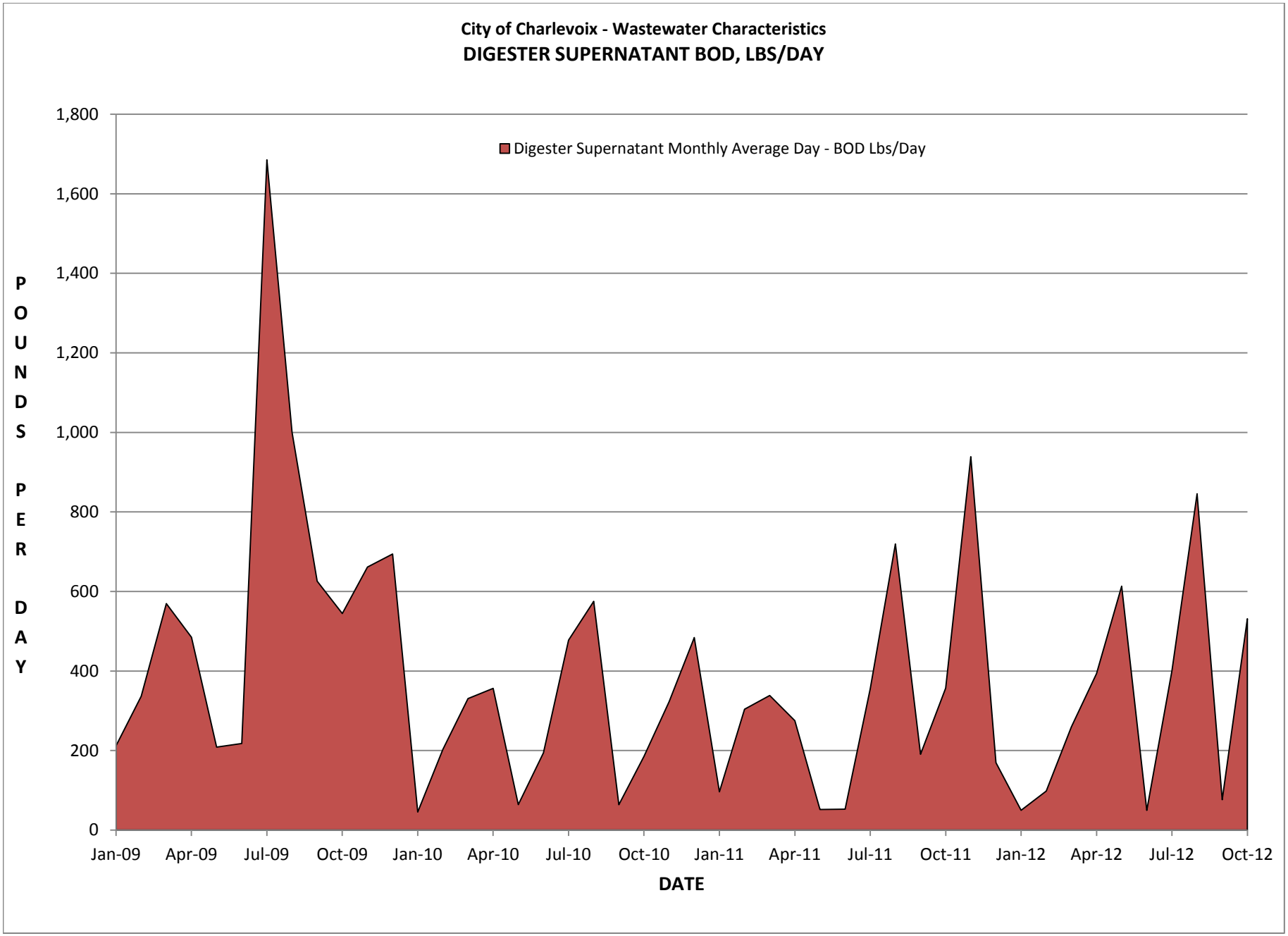

City of Charlevoix - Wastewater Characteristics
EFFLUENT pH
Effluent pH Monthly Average Day
Effluent pH Monthly Minimum Day
8
7
6
5
4
3
2
p
H
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Apr-11
Jul-11
Oct-11
Jan-12
Apr-12
Jul-12
Oct-12
DATE


City of Charlevoix - Wastewater Characteristics
ACTIVATED SLUDGE FOOD TO MICRO-ORGANISM (F/M) RATIO
Activated Sludge Food to Micro-organism Ratio - F/M
Ten States Maximum F/M Ratio for Nitrification
Both Aeration Tanks in Operation From April 11, 2011 to October 9, 2011 and From October 21, 2011 to End of Year
RATIO
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Apr-11
Jul-11
Oct-11
Jan-12
Apr-12
Jul-12
Oct-12
DATE


City of Charlevoix - Wastewater Characteristics
AERATION TANK BOD LOADING, LBS/1000 CF
Aeration Tank Organic Loading Lbs BOD/1000 CuFt Aeration Tank
Ten States Maximum Aeration Tank Loading for Nitrification- Lbs BOD/1000 CuFt Aeration Tank
Both Aeration Tanks in Operation From April 11, 2011 to October 9, 2011 and From October 21, 2011 to End of Year
POUNDS OF BOD
0
20
40
60
80
100
120
140
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Apr-11
Jul-11
Oct-11
Jan-12
Apr-12
Jul-12
Oct-12
DATE


City of Charlevoix - Wastewater Characteristics
DIGESTER SUPERNATANT, 1000 GAL/DAY
Digester Supernatant Monthly Average Day - Thousand Gallons per Day
THOUSAND GALLONS PER DAY
100
90
80
70
60
50
40
30
20
10
0
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Apr-11
Jul-11
Oct-11
Jan-12
Apr-12
Jul-12
Oct-12
DATE


City of Charlevoix - Wastewater Characteristics
DIGESTER SUPERNATANT BOD, MG/L
Digester Supernatant Monthly Average Day BOD mg/L
MILLIGRAMS PER LITER
3,500
3,000
2,500
2,000
1,500
1,000
500
0
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Apr-11
Jul-11
Oct-11
Jan-12
Apr-12
Jul-12
Oct-12
DATE


City of Charlevoix - Wastewater Characteristics
DIGESTER SUPERNATANT BOD, LBS/DAY
Digester Supernatant Monthly Average Day - BOD Lbs/Day
POUNDS PER DAY
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Apr-11
Jul-11
Oct-11
Jan-12
Apr-12
Jul-12
Oct-12
DATE

Appendix E

Discharge Permit-NPDES Permit No. MI0057737

PERMIT NO. MI0057737

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Water Pollution Control Act, as amended, (33 U.S.C. 1251 *et seq*.) (the "Federal Act"), Michigan Act 451, Public Acts of 1994, as amended (the "Michigan Act"), Parts 31 and 41, and Michigan Executive Order 2009-45,

City of Charlevoix
210 State Street
Charlevoix, Michigan 49720

is authorized to discharge from the **City of Charlevoix Wastewater Treatment Plant** located at

15116 Lakeshore Drive
Charlevoix, Michigan 49720

designated as **Charlevoix WWTP**

to the receiving water named Lake Michigan in accordance with effluent limitations, monitoring requirements, and other conditions set forth in this permit.

This permit is based on a complete application submitted on March 31, 2009.

This permit takes effect on June 1, 2011. 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. On its effective date this permit shall supersede NPDES Permit No. MI0057737, expiring October 1, 2009.

This permit and the authorization to discharge shall expire at midnight, **October 1, 2014**. 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 Michigan Department of Environmental Quality (Department) by **April 4, 2014**.

Issued April 1, 2011

Original Permit Signed by Michael Bray
Michael J. Bray, Acting Chief
Permits Section
Water Resources Division

PERMIT FEE REQUIREMENTS

In accordance with Section 324.3120 of the Michigan Act, the permittee shall make payment of an annual permit fee to the Department for each October 1 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 January 15 for notices mailed by December 1. The fee is due no later than 45 days after receiving the notice for notices mailed after December 1.

Annual Permit Fee Classification: Municipal Minor, 1 MGD to less than 10 MGD (IP)

In accordance with Section 324.3132 of the Michigan Act, the permittee shall make payment of an annual biosolids land application fee to the Department if the permittee land applies biosolids. In response to the Department's annual notice, the permittee shall submit the fee, which shall be postmarked no later than January 31 of each year.

CONTACT INFORMATION

Unless specified otherwise, all contact with the Department required by this permit shall be made to the Cadillac District Supervisor of the Water Resources Division. The Cadillac District Office is located at 120 West Chapin Street, Cadillac, Michigan 49601, Telephone: 231-775-3960, Fax: 231-775-1511.

CONTESTED CASE INFORMATION

Any person who is aggrieved by this permit may file a sworn petition with the State Office of Administrative Hearings and Rules of the Michigan Department of Energy, 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 Energy, Labor, and Economic Growth may reject any petition filed more than 60 days after issuance as being untimely.

PART I

Section A. Limitations and Monitoring Requirements

1. Final Effluent Limitations, Monitoring Point 001A

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 treated municipal wastewater from Monitoring Point 001A through Outfall 001. Outfall 001 discharges to Lake Michigan. Such discharge shall be limited and monitored by the permittee as specified below.

	Maximum Limits for Quantity or Loading				Maximum Limits for Quality or Concentration					
Parameter	**Monthly**	**7-Day**	**Daily**	**Units**	**Monthly**	**7-Day**	**Daily**	**Units**	**Monitoring Frequency**	**Sample Type**
Flow	(report)	---	(report)	MGD	---	---	---	---	Daily	Report Total Daily Flow
Carbonaceous Biochemical Oxygen Demand ($CBOD_5$)										
	210	330	---	lbs/day	25	40	---	mg/l	5/Week	24-Hr Composite
Total Suspended Solids										
	250	380	---	lbs/day	30	45	---	mg/l	5/Week	24-Hr Composite
Ammonia Nitrogen (as N)										
Effective Date until 9/30/2014										
5/1 – 9/30	---	---	---	---	(report)	---	---	mg/l	Weekly	24-Hr Composite
Beginning 10/1/2014										
5/1 – 9/30	---	---	---	---	30	---	---	mg/l	Weekly	24-Hr Composite
10/1 – 4/30	---	---	---	---	(report)	---	---	mg/l	Monthly	24-Hr Composite
Beginning 12/1/2015										
5/1 – 9/30	---	---	---	---	5.4	---	---	mg/l	Weekly	24-Hr Composite
10/1 – 11/30	---	---	---	---	12	---	---	mg/l	Weekly	24-Hr Composite
12/1 – 3/31	---	---	---	---	20	---	---	mg/l	Weekly	24-Hr Composite
4/1 – 4/30	---	---	---	---	13	---	---	mg/l	Weekly	24-Hr Composite
Total Phosphorus (as P)										
	8	---	---	lbs/day	1.0	---	---	mg/l	5/Week	24-Hr Composite
Fecal Coliform Bacteria	---	---	---	---	200	400	---	ct/100 ml	5/Week	Grab
Total Residual Chlorine	---	---	---	---	---	---	0.038	mg/l	5/Week	Grab
Total Mercury	(report)	---	---	lbs/day	(report)	---	---	ng/l	Monthly	Grab
	12-Month Rolling Average				**12-Month Rolling Average**					
Total Mercury	0.000058	---	---	lbs/day	7	---	---	ng/l	Monthly	Calculation
					Minimum Monthly					
$CBOD_5$ Minimum % Removal		---	---	---	85	---	---	%	Monthly	Calculation
Total Suspended Solids Minimum % Removal				---	85	---	---	%	Monthly	Calculation
					Minimum Daily		**Maximum Daily**			
pH	---	---	---	---	6.5	---	9.0	S.U.	5/Week	Grab
Dissolved Oxygen	---	---	---	---	4.0	---	---	mg/l	5/Week	Grab

PART I

Section A. Limitations and Monitoring Requirements

The following design flow was used in determining the above limitations, but is not to be considered a limitation or actual capacity: 1.0 MGD (average).

a. Narrative Standard
The receiving water shall contain no turbidity, color, oil films, floating solids, foams, settleable solids, or deposits as a result of this discharge in unnatural quantities which are or may become injurious to any designated use.

b. Sampling Locations
Samples for $CBOD_5$, Total Suspended Solids, Ammonia Nitrogen, Total Phosphorus, and Total Mercury shall be taken prior to disinfection. Samples for Dissolved Oxygen, Fecal Coliform Bacteria, Total Residual Chlorine, and pH shall be taken after disinfection. The Department may approve alternate sampling locations which are demonstrated by the permittee to be representative of the effluent.

c. Final Effluent Limitation for Total Mercury
The final limit for total mercury is the Discharge Specific Level Currently Achievable (LCA) based on a multiple discharger variance from the water quality-based effluent limit of 1.3 ng/l, pursuant to Rule 323.1103(9) of the Water Quality Standards. Compliance with the LCA shall be determined as a 12-month rolling average. The 12-month rolling average shall be determined by adding the present monthly average result to the preceding 11 monthly average results then dividing the sum by 12. For facilities with quarterly monitoring requirements for total mercury, quarterly monitoring shall be equivalent to 3 months of monitoring in calculating the 12-month rolling average. Facilities that monitor more frequently than monthly for total mercury must determine the monthly average result, which is the sum of the results of all data obtained in a given month divided by the total number of samples taken, in order to calculate the 12-month rolling average. If the 12-month rolling average for any month is less than or equal to the LCA, the permittee will be considered to be in compliance for total mercury for that month, provided the permittee is also in full compliance with the Pollutant Minimization Program for Total Mercury, set forth in Part I.A.2.

After a minimum of 12 monthly data points have been collected, the permittee may request a reduction in the monitoring frequency for total mercury. This request shall contain an explanation as to why the reduced monitoring is appropriate and shall be submitted to the Department. Upon receipt of written approval and consistent with such approval, the permittee may reduce the monitoring frequency for total mercury indicated in Part I.A.1. of this permit. The Department may revoke the approval for reduced monitoring at any time upon notification to the permittee

d. Total Mercury Testing Requirements
The analytical protocol for total mercury shall be in accordance with EPA Method 1631, Revision E, “Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry”. The quantification level for total mercury shall be 0.5 ng/l, unless a higher level is appropriate because of sample matrix interference. Justification for higher quantification levels shall be submitted to the Department within 30 days of such determination.

The use of clean technique sampling procedures is required unless the permittee can demonstrate to the Department that an alternative sampling procedure is representative of the discharge. Guidance for clean technique sampling is contained in: EPA Method 1669, *Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels (Sampling Guidance)*, EPA-821-R96-001, July 1996. Information and data documenting the permittee's sampling and analytical protocols and data acceptability shall be submitted to the Department upon request.

e. Percent Removal Requirements
These requirements shall be calculated based on the monthly (30-day) effluent $CBOD_5$ and Total Suspended Solids concentrations and the monthly influent concentrations for approximately the same period.

PART I

Section A. Limitations and Monitoring Requirements

f. Total Residual Chlorine

Compliance with the Total Residual Chlorine limit shall be determined on the basis of one or more grab samples. If more than one (1) sample per day is taken, the additional samples shall be collected in near equal intervals over at least eight (8) hours. The samples shall be analyzed immediately upon collection and the average reported as the daily concentration. Amperometric Titration using either Standard Method 4500-Cl D, Standard Method 4500-Cl E or the Orion 97-70 electrode shall be used for analysis (other analytical methods specified in 40 CFR 136 may be used upon approval of the Department).

If, upon review of the monitoring, it is determined that ammonia or toxicity require limiting to protect the receiving waters in accordance with applicable water quality standards, the permit may then be modified by the Department in accordance with applicable laws and rules.

g. Monitoring Frequency Reduction for Ammonia

After the submittal of two years of data, the permittee may request, in writing, Department approval of a reduction in monitoring frequency for ammonia. This request shall contain an explanation as to why the reduced monitoring is appropriate. Upon receipt of written approval and consistent with such approval, the permittee may reduce the monitoring frequency indicated in Part I.A.1. of this permit. The monitoring frequency for ammonia shall not be reduced to less than monthly. The Department may revoke the approval for reduced monitoring at any time upon notification to the permittee.

PART I

Section A. Limitations and Monitoring Requirements

2. Pollutant Minimization Program for Total Mercury

The goal of the Pollutant Minimization Program is to maintain the effluent concentration of total mercury at or below 1.3 ng/l. The permittee shall continue to implement the Pollutant Minimization Program approved on March 22, 2007, and modifications thereto, to proceed toward the goal. The Pollutant Minimization Program includes the following:

a. an annual review and semi-annual monitoring of potential sources of mercury entering the wastewater collection system;

b. a program for quarterly monitoring of influent and periodic monitoring of sludge for mercury; and

c. implementation of reasonable cost-effective control measures when sources of mercury are discovered. Factors to be considered include significance of sources, economic considerations, and technical and treatability considerations.

On or before March 31 of each year, the permittee shall submit a status report for the previous calendar year to the Department that includes 1) the monitoring results for the previous year, 2) an updated list of potential mercury sources, and 3) a summary of all actions taken to reduce or eliminate identified sources of mercury.

Any information generated as a result of the Pollutant Minimization Program set forth in this permit may be used to support a request to modify the approved program or to demonstrate that the Pollutant Minimization Program requirement has been completed satisfactorily.

A request for modification of the approved program and supporting documentation shall be submitted in writing to the Department for review and approval. The Department may approve modifications to the approved program (approval of a program modification does not require a permit modification), including a reduction in the frequency of the requirements under items a. & b.

This permit may be modified in accordance with applicable laws and rules to include additional mercury conditions and/or limitations as necessary.

PART I

Section A. Limitations and Monitoring Requirements

3. Additional Monitoring Requirements

As a condition of this permit, the permittee shall monitor the discharge from monitoring point 001A for the constituents listed below. This monitoring is an application requirement of 40 CFR 122.21(j), effective December 2, 1999. Testing shall be conducted in August 2011, May 2012, March 2013, and October 2013. Grab samples shall be taken for available cyanide, total phenols, and parameters listed under Volatile Organic Compounds. For all other parameters, 24-hour composite samples shall be taken.

Test species for whole effluent toxicity monitoring shall include fathead minnow **and** either *Daphnia magna, Daphnia pulex* or *Ceriodaphnia dubia*. The permittee has received Department approval to conduct acute toxicity testing using Fathead Minnow, the more sensitive species identified in the toxicity database. The first three (3) tests required above may be performed using the more sensitive species. The last (4th) test shall be conducted using two (2) test species. Testing and reporting procedures shall follow procedures contained in EPA/600/4-90/027/F, "Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms (Fifth Edition)." When the effluent ammonia nitrogen (as N) concentration is greater than 5 mg/l, the pH of the toxicity test shall be maintained at the pH of the effluent at the time of sample collection. Toxicity test data acceptability is contingent upon the validation of the test method by the testing laboratory. Such validation shall be submitted to the Department upon request.

The results of such monitoring shall be submitted with the application for reissuance (see the cover page of this permit for the application due date). The permittee shall notify the Department within 14 days of completing the monitoring for each month specified above in accordance with Part II.C.5. Additional reporting requirements are specified in Part II.C.11. The permittee shall report to the Department any whole effluent toxicity test results greater than 1.0 TU_A or 1.0 TU_C within five (5) days of becoming aware of the result. If, upon review of the analysis, it is determined that additional requirements are needed to protect the receiving waters in accordance with applicable water quality standards, the permit may then be modified by the Department in accordance with applicable laws and rules.

Whole Effluent Toxicity
Acute toxicity

Hardness
calcium carbonate

Metals (Total Recoverable), Cyanide and Total Phenols (Quantification levels in parentheses)

antimony (1 µg/l)	arsenic (1 µg/l)	barium (5 µg/l)
beryllium (1 µg/l)	boron (20 µg/l)	cadmium (0.2 µg/l)
chromium (5 µg/l)	copper (1 µg/l)	lead (1 µg/l)
nickel (5 µg/l)	selenium (1 µg/l)	silver (0.5 µg/l)
thallium (1 µg/l)	zinc (5 µg/l)	

available cyanide (2 µg/l) using Method OIA - 1677
total phenolic compounds

Volatile Organic Compounds

acrolein	acrylonitrile	benzene
bromoform	carbon tetrachloride	chlorobenzene
chlorodibromomethane	chloroethane	2-chloroethylvinyl ether
chloroform	dichlorobromomethane	1,1-dichloroethane
1,2-dichloroethane	trans-1,2-dichloroethylene	1,1-dichloroethylene
1,2-dichloropropane	1,3-dichloropropylene	ethylbenzene
methyl bromide	methyl chloride	methylene chloride
1,1,2,2,-tetrachloroethane	tetrachloroethylene	toluene
1,1,1-trichloroethane	1,1,2-trichloroethane	trichloroethylene
vinyl chloride		

PART I

Section A. Limitations and Monitoring Requirements

Acid-Extractable Compounds

p-chloro-m-creso	2-chlorophenol	2,4-dichlorophenol
2,4-dimethylphenol	4,6-dinitro-o-cresol	2,4-dinitrophenol
2-nitrophenol	4-nitrophenol	pentachlorophenol
phenol	2,4,6-trichlorophenol	

Base/Neutral Compounds

acenaphthene	acenaphthylene	anthracene
benzidine	benzo(a)anthracene	benzo(a)pyrene
3,4-benzofluoranthene	benzo(ghi)perylene	benzo(k)fluoranthene
bis(2-chloroethoxy)methane	bis(2-chloroethyl)ether	bis(2-chloroisopropyl)ether
bis(2-ethylhexyl)phthalate	4-bromophenyl phenyl ether	butyl benzyl phthalate
2-chloronaphthalene	4-chlorophenyl phenyl ether	chrysene
di-n-butyl phthalate	di-n-octyl phthalate	dibenzo(a,h)anthracene
1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene
3,3'-dichlorobenzidine	diethyl phthalate	dimethyl phthalate
2,4-dinitrotoluene	2,6-dinitrotoluene	1,2-diphenylhydrazine
fluoranthene	fluorene	hexachlorobenzene
hexachlorobutadiene	hexachlorocyclo-pentadiene	hexachloroethane
indeno(1,2,3-cd)pyrene	isophorone	naphthalene
nitrobenzene	n-nitrosodi-n-propylamine	n-nitrosodimethylamine
n-nitrosodiphenylamine	phenanthrene	pyrene
1,2,4-trichlorobenzene		

4. Facility Contact

The “Facility Contact” was specified in the application. The permittee may replace the facility contact at any time, and shall notify the Department in writing within 10 days after replacement (including the name, address and telephone number of the new facility contact).

a. The facility contact shall be (or a duly authorized representative of this person):
- for a corporation, a principal executive officer of at least the level of vice president, or a designated representative, if the representative is responsible for the overall operation of the facility from which the discharge described in the permit application or other NPDES form originates,
- for a partnership, a general partner,
- for a sole proprietorship, the proprietor, or
- for a municipal, state, or other public facility, either a principal executive officer, the mayor, village president, city or village manager or other duly authorized employee.

b. A person is a duly authorized representative only if:
- the authorization is made in writing to the Department by a person described in paragraph a. of this section; and
- the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the facility (a duly authorized representative may thus be either a named individual or any individual occupying a named position).

Nothing in this section obviates the permittee from properly submitting reports and forms as required by law.

PART I

Section A. Limitations and Monitoring Requirements

5. Untreated or Partially Treated Sewage Discharge Requirements

In accordance with Section 324.3112a of the Michigan Act, if untreated sewage, including sanitary sewer overflows (SSO) and combined sewer overflows (CSO), or partially treated sewage is directly or indirectly discharged from a sewer system onto land or into the waters of the state, the entity responsible for the sewer system shall immediately, but not more than 24 hours after the discharge begins, notify, by telephone, the Department, local health departments, a daily newspaper of general circulation in the county in which the permittee is located, and a daily newspaper of general circulation in the county or counties in which the municipalities whose waters may be affected by the discharge are located that the discharge is occurring.

The permittee shall also annually contact municipalities, including the superintendent of a public drinking water supply with potentially affected intakes, whose waters may be affected by the permittee's discharge of combined sewage, and if those municipalities wish to be notified in the same manner as specified above, the permittee shall provide such notification. Such notification shall also include a daily newspaper in the county of the affected municipality.

At the conclusion of the discharge, written notification shall be submitted in accordance with and on the "CSO/SSO Reporting Form" available via the internet at: http://www.michigan.gov/deq/0,1607,7-135-3313_3682_3715---,00.html, or, alternatively for combined sewer overflow discharges, in accordance with notification procedures approved by the Department.

In addition, in accordance with Section 324.3112a of the Michigan Act, each time a discharge of untreated sewage or partially treated sewage occurs, the permittee shall test the affected waters for Escherichia coli to assess the risk to the public health as a result of the discharge and shall provide the test results to the affected local county health departments and to the Department. The testing shall be done at locations specified by each affected local county health department but shall not exceed 10 tests for each separate discharge event. The affected local county health department may waive this testing requirement, if it determines that such testing is not needed to assess the risk to the public health as a result of the discharge event. The results of this testing shall be submitted with the written notification required above, or, if the results are not yet available, submit them as soon as they become available. This testing is not required, if the testing has been waived by the local health department, or if the discharge(s) did not affect surface waters.

Permittees accepting sanitary or municipal sewage from other sewage collection systems are encouraged to notify the owners of those systems of the above reporting and testing requirements.

6. Monthly Operating Reports

Part 41 of Act 451 of 1994 as amended, specifically Section 324.4106 and associated Rule 299.2953, requires that the permittee file with the Department, on forms prescribed by the Department, reports showing the effectiveness of the treatment facility operation and the quantity and quality of liquid wastes discharged into waters of the state.

Within thirty (30) days of the effective date of this permit the permittee shall submit to the Department a treatment facility monitoring program to meet this requirement. Upon approval by the Department the permittee shall implement the treatment facility monitoring program. The reporting forms and guidance are available on the DNRE web site at http://www.michigan.gov/dnre/0,1607,7-135-3313_44117---,00.html. The permittee may use alternative operating forms if they are consistent with the approved monitoring program. These forms shall be maintained on site and shall be provided to the Department for review upon request. These treatment facility monitoring records shall be maintained for a minimum of three years.

PART I

Section B. Schedule of Compliance

1. Schedule of Compliance

The permittee shall achieve compliance with the final effluent limitations for monitoring point 001 specified in Part I.A.1., in accordance with the following schedule. All submittals shall be to the Department.

a. On or before July 1, 2011, the permittee shall complete pump and other plant maintenance to allow concurrent operation of both halves of the treatment plant, as necessary, to meet limits in Part I.A.1. Alternative treatment improvements leading to reduced ammonia or toxicity control may be approved by the Department.

b. On or before August 1, 2011, the permittee shall submit a monitoring and study plan to evaluate treatment operations and/or causes of chronic ammonia toxicity problems.

c. On or before September 1, 2011, the permittee shall acquire a consultant/engineer to assist with long-term treatment improvement and chronic ammonia toxicity reduction.

d. On or before September 1, 2013, the permittee shall submit data analysis and a description and evaluation of options considered in correcting the ammonia toxicity problem, including a detailed description of the selected alternative(s). A schedule for acquisition and implementation of the selected alternative(s) shall be included.

e. On or before 10/1/2015, the permittee shall complete construction of corrective facilities, or implementation of other approved remedies.

f. On or before 12/1/2015, the permittee shall attain and maintain an operational level necessary to meet the limits specified in Part I.A.1.

PART I

Section C. Industrial Waste Pretreatment Program

1. Industrial Waste Pretreatment Program

It is understood that the permittee does not receive the discharge of any type or quantity of substance which may cause interference with the operation of the treatment works; and, therefore, the permittee is not required to immediately develop an industrial pretreatment program in accordance with Section 307 of the Federal Act. The permittee is required to comply with Section 307 of the Federal Act upon accepting any such discharge for treatment. The permittee is required to notify the Department within thirty days if any user discharges or proposes to discharge such wastes to the permittee for treatment.

Under no circumstances shall the permittee allow introduction of the following wastes into the waste treatment system:

a. pollutants which cause pass through or interference;

b. pollutants which create a fire hazard or explosion hazard in the sewerage system, including, but not limited to waste streams with a closed cup flashpoint of less than 140 degrees Fahrenheit or 60 degrees Centigrade using the test methods specified in 40 CFR 261.21;

c. pollutants which will cause corrosive structural damage to the sewerage system; but in no case, discharges with pH less than 5.0, unless the works is specifically designed to accommodate such discharges;

d. solid or viscous pollutants in amounts which will cause obstruction to the flow in the sewerage system resulting in interference;

e. any pollutant, including oxygen demanding pollutants (BOD, etc.) released in a discharge at a flow rate and/or pollutant concentration which will cause interference with the treatment plant;

f. heat in amounts which will inhibit biological activity in the treatment plant resulting in interference; but in no case, heat in such quantities that the temperature at the treatment plant exceeds 40 degrees Centigrade (104 degrees Fahrenheit) unless the Department, upon request of the permittee, approves alternate temperature limits;

g. pollutants which result in the presence of toxic gases, vapors or fumes within the sewerage system in a quantity that may cause acute worker health and safety problems; and

h. any trucked or hauled pollutants, except at discharge points designated by the permittee.

If information is gained by the Department that the permittee receives or is about to receive industrial wastes, then this permit may be modified in accordance with applicable laws and rules to incorporate the requirements of Section 307 of the Federal Act.

PART I

Section D. Residuals Management Program

1. Residuals Management Program for Land Application of Biosolids

The permittee is authorized to land apply bulk biosolids or prepare bulk biosolids for land application in accordance with the permittee's approved Residuals Management Program (RMP) approved on June 28, 2001 and approved modifications thereto in accordance with the requirements established in R323.2401 through R323.2418 of the Michigan Administrative Code (Part 24 Rules). The approved RMP, and any approved modifications thereto, are enforceable requirements of this permit. Incineration, landfilling and other residual disposal activities shall be conducted in accordance with Part II.D.7. of this permit. The Part 24 Rules can be obtained via the internet (http://www.michigan.gov/dnre/ and on the left side of the screen click on Water, Biosolids & Industrial Pretreatment, Biosolids then click on Biosolids laws and Rules Information which is under the Laws & Rules banner in the center of the screen).

a. Annual Report

On or before October 30 of each year, the permittee shall submit to the Department an annual report for the previous fiscal year of October 1 through September 30. At a minimum, the report shall contain:

1) a certification that current residuals management practices are in accordance with the approved RMP, or a proposal for modification to the approved RMP; and

2) a completed Biosolids Annual Report Form which can be obtained via the internet (http://www.michigan.gov/deq/ and on the left side of the screen click on Water, Biosolids & Industrial Pretreatment, Biosolids then click on Biosolids Annual Report Form which is under the Downloads banner in the center of the screen) or from the Department.

b. Modifications to the Approved RMP

Prior to implementation of modifications to the RMP, the permittee shall submit proposed modifications to the Department for approval. The approved modification shall become effective upon the date of approval. Upon written notification, the Department may impose additional requirements and/or limitations to the approved RMP as necessary to protect public health and the environment from any adverse effect of a pollutant in the biosolids.

c. Record Retention

Records required by the Part 24 Rules shall be kept for a minimum of five years. However, the records documenting cumulative loading for sites subject to cumulative pollutant loading rates shall be kept as long as the site receives biosolids.

PART II

Section A. Definitions

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

Acute toxic unit (TU_A) means $100/LC_{50}$ where the LC_{50} is determined from a whole effluent toxicity (WET) test which produces a result that is statistically or graphically estimated to be lethal to 50% of the test organisms.

Bioaccumulative chemical of concern (BCC) means a chemical which, upon entering the surface waters, by itself or as its toxic transformation product, accumulates in aquatic organisms by a human health bioaccumulation factor of more than 1000 after considering metabolism and other physiochemical properties that might enhance or inhibit bioaccumulation. The human health bioaccumulation factor shall be derived according to R 323.1057(5). Chemicals with half-lives of less than 8 weeks in the water column, sediment, and biota are not BCCs. The minimum bioaccumulation concentration factor (BAF) information needed to define an organic chemical as a BCC is either a field-measured BAF or a BAF derived using the biota-sediment accumulation factor (BSAF) methodology. The minimum BAF information needed to define an inorganic chemical as a BCC, including an organometal, is either a field-measured BAF or a laboratory-measured bioconcentration factor (BCF). The BCCs to which these rules apply are identified in Table 5 of R 323.1057 of the Water Quality Standards.

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.

Chronic toxic unit (TU_C) means 100/MATC or $100/IC_{25}$, where the maximum acceptable toxicant concentration (MATC) and IC_{25} are expressed as a percent effluent in the test medium.

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. The daily concentration will be used to determine compliance with any maximum and minimum daily concentration limitations (except for pH and dissolved oxygen). When required by the permit, report the maximum calculated daily concentration for the month in the “MAXIMUM” column under “QUALITY OR CONCENTRATION” on the Discharge Monitoring Reports (DMRs).

For pH, report the maximum value of any <u>individual</u> sample taken during the month in the “MAXIMUM” column under “QUALITY OR CONCENTRATION” on the DMRs and the minimum value of any <u>individual</u> sample taken during the month in the “MINIMUM” column under “QUALITY OR CONCENTRATION” on the DMRs. For dissolved oxygen, report the minimum concentration of any <u>individual</u> sample in the “MINIMUM” column under “QUALITY OR CONCENTRATION” on the DMRs.

Daily loading is the total discharge by weight of a parameter discharged during any calendar day. This value is calculated by multiplying the daily concentration by the total daily flow and by the appropriate conversion factor. The daily loading will be used to determine compliance with any maximum daily loading limitations. When required by the permit, report the maximum calculated daily loading for the month in the “MAXIMUM” column under “QUANTITY OR LOADING” on the DMRs.

Department means the Michigan Department of Natural Resources and Environment.

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.

PART II

Section A. Definitions

Discharge Event is a discrete occurrence during which effluent is discharged to the surface water up to 10 days of a consecutive 14 day period.

EC_{50} means a statistically or graphically estimated concentration that is expected to cause 1 or more specified effects in 50% of a group of organisms under specified conditions.

Fecal coliform bacteria monthly is the geometric mean of the samples collected in a calendar month (or 30 consecutive days). The calculated monthly value will be used to determine compliance with the maximum monthly fecal coliform bacteria limitations. When required by the permit, report the calculated monthly value in the "AVERAGE" column under "QUALITY OR CONCENTRATION" on the DMRs. FOR SEASONAL LAGOON DISCHARGES ONLY: If the period in which the discharge occurred was partially in each of two months, the monthly average shall be reported on the DMR of the month in which the last day of discharge occurred.

Fecal coliform bacteria 7-day is the geometric mean of the samples collected in any 7-day period. The calculated 7-day value will be used to determine compliance with the maximum 7-day fecal coliform bacteria limitations. When required by the permit, report the maximum calculated 7-day concentration for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs. FOR SEASONAL LAGOON DISCHARGES ONLY: If the seven day period was partially in each of two months, the seven day average shall be reported on the DMR of the month in which the last day of discharge occurred.

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

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

Geometric Mean is the average of the logarithmic values of a base 10 data set, converted back to a base 10 number.

IC_{25} means the toxicant concentration that would cause a 25% reduction in a nonquantal biological measurement for the test population.

Interference is a discharge which, alone or in conjunction with a discharge or discharges from other sources, both: 1) inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and 2) therefore, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or, of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent state or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including Title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including state regulations contained in any state sludge management plan prepared pursuant to Subtitle D of the SWDA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act. [This definition does not apply to sample matrix interference.]

Land Application means spraying or spreading biosolids or a biosolids derivative onto the land surface, injecting below the land surface, or incorporating into the soil so that the biosolids or biosolids derivative can either condition the soil or fertilize crops or vegetation grown in the soil.

LC_{50} means a statistically or graphically estimated concentration that is expected to be lethal to 50% of a group of organisms under specified conditions.

Maximum acceptable toxicant concentration (MATC) means the concentration obtained by calculating the geometric mean of the lower and upper chronic limits from a chronic test. A lower chronic limit is the highest tested concentration that did not cause the occurrence of a specific adverse effect. An upper chronic limit is the lowest tested concentration which did cause the occurrence of a specific adverse effect and above which all tested concentrations caused such an occurrence.

PART II

Section A. Definitions

MGD means million gallons per day.

Monthly monitoring frequency 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.

Monthly concentration is the sum of the daily concentrations determined during a reporting month (or 30 consecutive days) divided by the number of daily concentrations determined. The calculated monthly concentration will be used to determine compliance with any maximum monthly concentration limitations. When required by the permit, report the calculated monthly concentration in the “AVERAGE” column under “QUALITY OR CONCENTRATION” on the DMRs. FOR SEASONAL LAGOON DISCHARGES ONLY: If the period in which the discharge occurred was partially in each of two months, the monthly average shall be reported on the DMR of the month in which the last day of discharge occurred.

For minimum percent removal requirements, the monthly influent concentration and the monthly effluent concentration shall be determined. The calculated monthly percent removal, which is equal to 100 times the quantity [1 minus the quantity (monthly effluent concentration divided by the monthly influent concentration)], shall be reported in the "MINIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs.

Monthly loading is the sum of the daily loadings of a parameter divided by the number of daily loadings determined in the reporting month (or 30 consecutive days). The calculated monthly loading will be used to determine compliance with any maximum monthly loading limitations. When required by the permit, report the calculated monthly loading in the “AVERAGE” column under “QUANTITY OR LOADING” on the DMRs. FOR SEASONAL LAGOON DISCHARGES ONLY: If the period in which the discharge occurred was partially in each of two months, the monthly average shall be reported on the DMR of the month in which the last day of discharge occurred.

National Pretreatment Standards are the regulations promulgated by or to be promulgated by the Federal Environmental Protection Agency pursuant to Section 307(b) and (c) of the Federal Act. The standards establish nationwide limits for specific industrial categories for discharge to a POTW.

No observed adverse effect level (NOAEL) means the highest tested dose or concentration of a substance which results in no observed adverse effect in exposed test organisms where higher doses or concentrations result in an adverse effect.

Noncontact Cooling Water is water used for cooling which does not come into direct contact with any raw material, intermediate product, by-product, waste product or finished product.

Nondomestic user is any discharger to a POTW that discharges wastes other than or in addition to water-carried wastes from toilet, kitchen, laundry, bathing or other facilities used for household purposes.

Partially treated sewage is any sewage, sewage and storm water, or sewage and wastewater, from domestic or industrial sources that is treated to a level less than that required by the permittee's National Pollutant Discharge Elimination System permit, or that is not treated to national secondary treatment standards for wastewater, including discharges to surface waters from retention treatment facilities.

Pretreatment is reducing the amount of pollutants, eliminating pollutants, or altering the nature of pollutant properties to a less harmful state prior to discharge into a public sewer. The reduction or alteration can be by physical, chemical, or biological processes, process changes, or by other means. Dilution is not considered pretreatment unless expressly authorized by an applicable National Pretreatment Standard for a particular industrial category.

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

Section A. Definitions

Quarterly monitoring frequency 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.

Regional Administrator is the Region 5 Administrator, U.S. EPA, located at R-19J, 77 W. Jackson Blvd., Chicago, Illinois 60604.

Significant industrial user is a nondomestic user that: 1) is subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N; or 2) discharges an average of 25,000 gallons per day or more of process wastewater to a POTW (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process wastestream which makes up five (5) percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the permittee as defined in 40 CFR 403.12(a) on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's treatment plant operation or violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Significant Materials Significant Materials means any material which could degrade or impair water quality, including but not limited to: raw materials; fuels; solvents, detergents, and plastic pellets; finished materials such as metallic products; hazardous substances designated under Section 101(14) of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (see 40 CFR 372.65); any chemical the facility is required to report pursuant to Section 313 of Emergency Planning and Community Right-to-Know Act (EPCRA); polluting materials as identified under the Part 5 Rules (Rules 324.2001 through 324.2009 of the Michigan Administrative Code); Hazardous Wastes as defined in Part 111 of the Michigan Act; fertilizers; pesticides; and waste products such as ashes, slag, and sludge that have the potential to be released with storm water discharges.

Tier I value means a value for aquatic life, human health or wildlife calculated under R 323.1057 of the Water Quality Standards using a tier I toxicity database.

Tier II value means a value for aquatic life, human health or wildlife calculated under R 323.1057 of the Water Quality Standards using a tier II toxicity database.

Total Maximum Daily Loads (TMDLs) are required by the Federal Act for waterbodies that do not meet Water Quality Standards. TMDLs represent the maximum daily load of a pollutant that a waterbody can assimilate and meet Water Quality Standards and an allocation of that load among point sources, nonpoint sources, and a margin of safety.

Toxicity Reduction Evaluation (TRE) means a site-specific study conducted in a stepwise process designed to identify the causative agents of effluent toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in effluent toxicity.

Water Quality Standards means the Part 4 Water Quality Standards promulgated pursuant to Part 31 of Act No. 451 of the Public Acts of 1994, as amended, being Rules 323.1041 through 323.1117 of the Michigan Administrative Code.

Weekly monitoring frequency 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.

Yearly monitoring frequency 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.

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

Section A. Definitions

3-Portion Composite sample is a sample consisting of three equal volume grab samples collected at equal intervals over an 8-hour period.

7-day concentration is the sum of the daily concentrations determined during any 7 consecutive days in a reporting month divided by the number of daily concentrations determined. The calculated 7-day concentration will be used to determine compliance with any maximum 7-day concentration limitations. When required by the permit, report the maximum calculated 7-day concentration for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs. FOR SEASONAL LAGOON DISCHARGES ONLY: If the seven day period was partially in each of two months, the seven day average shall be reported on the DMR of the month in which the last day of discharge occurred.

7-day loading is the sum of the daily loadings of a parameter divided by the number of daily loadings determined during any 7 consecutive days in a reporting month. The calculated 7-day loading will be used to determine compliance with any maximum 7-day loading limitations. When required by the permit, report the maximum calculated 7-day loading for the month in the "MAXIMUM" column under "QUANTITY OR LOADING" on the DMRs. FOR SEASONAL LAGOON DISCHARGES ONLY: If the seven day period was partially in each of two months, the seven day average shall be reported on the DMR of the month in which the last day of discharge occurred.

PART II

Section B. Monitoring Procedures

1. Representative Samples

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

2. Test Procedures

Test procedures for the analysis of pollutants shall conform to regulations promulgated pursuant to Section 304(h) of the Federal Act (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 promulgated under 40 CFR Part 136 for pollutant monitoring required by this permit shall be made in accordance with the Alternate Test Procedures regulations specified in 40 CFR 136.4. These requests shall be submitted to the Chief of the Permits Section, Water Bureau, Michigan Department of Natural Resources and Environment, P.O. Box 30273, Lansing, Michigan, 48909-7773. The permittee may use such procedures upon 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.

3. Instrumentation

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

4. Recording Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information: 1) the exact place, date, and time of measurement or sampling; 2) the person(s) who performed the measurement or sample collection; 3) the dates the analyses were performed; 4) the person(s) who performed the analyses; 5) the analytical techniques or methods used; 6) the date of and person responsible for equipment calibration; and 7) the results of all required analyses.

5. Records Retention

All records and information resulting from the monitoring activities required by this permit including all records of analyses performed and calibration and maintenance of instrumentation and recordings from continuous monitoring instrumentation shall be retained for a minimum of three (3) years, or longer if requested by the Regional Administrator or the Department.

PART II

Section C. Reporting Requirements

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. Submittal Requirements for Self-Monitoring Data

Part 31 of Act 451 of 1994, as amended, specifically Section 324.3110(3) and Rule 323.2155(2) of Part 21 allows the Department to specify the forms to be utilized for reporting the required self-monitoring data. Unless instructed on the effluent limitations page to conduct "Retained Self Monitoring" the permittee shall submit self-monitoring data via the Department's Electronic Environmental Discharge Monitoring Reporting (e2-DMR) system.

The permittee shall utilize the information provided on the e2-Reporting website @ https://secure1.state.mi.us/e2rs/ to access and submit the electronic forms. Both monthly summary and daily data shall be submitted to the department no later than the **20th day of the month** following each month of the authorized discharge period(s).

3. Retained Self-Monitoring Requirements

If instructed on the effluent limits page to conduct retained self-monitoring, the permittee shall maintain a year-to-date log of retained self-monitoring results and, upon request, provide such log for inspection to the staff of the Water Bureau, Michigan Department of Natural Resources and Environment. Retained self-monitoring results are public information and shall be promptly provided to the public upon request.

The permittee shall certify, in writing, to the Department, on or before January 10th of each year, that: 1) all retained self-monitoring requirements have been complied with and a year-to-date log has been maintained; and 2) the application on which this permit is based still accurately describes the discharge. With this annual certification, the permittee shall submit a summary of the previous years monitoring data. The summary shall include maximum values for samples to be reported as daily maximums and/or monthly maximums and minimum values for any daily minimum samples.

4. Additional Monitoring by Permittee

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report. Such increased frequency shall also be indicated.

Monitoring required pursuant to Part 41 of the Michigan Act or Rule 35 of the Mobile Home Park Commission Act (Act 96 of the Public Acts of 1987) for assurance of proper facility operation shall be submitted as required by the Department.

5. 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.

PART II

Section C. Reporting Requirements

6. Noncompliance Notification

Compliance with all applicable requirements set forth in the Federal Act, Parts 31 and 41 of the Michigan Act, and related regulations and rules is required. All instances of noncompliance shall be reported as follows:

a. 24-hour reporting - Any noncompliance which may endanger health or the environment (including maximum daily concentration discharge limitation exceedances) shall be reported, verbally, within 24 hours from the time the permittee becomes aware of the noncompliance. A written submission shall also be provided within five (5) days.

b. other reporting - The permittee shall report, in writing, all other instances of noncompliance not described in a. above at the time monitoring reports are submitted; or, in the case of retained self-monitoring, within five (5) days from the time the permittee becomes aware of the noncompliance.

Written reporting shall include: 1) a description of the discharge and cause of noncompliance; and 2) the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and the steps taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.

7. Spill Notification

The permittee shall immediately report any release of any polluting material which occurs to the surface waters or groundwaters of the state, unless the permittee has determined that the release is not in excess of the threshold reporting quantities specified in the Part 5 Rules (Rules 324.2001 through 324.2009 of the Michigan Administrative Code), by calling the Department at the number indicated on the second page of this permit, or if the notice is provided after regular working hours call the Department's 24-hour Pollution Emergency Alerting System telephone number, 1-800-292-4706 (calls from out-of-state dial 1-517-373-7660).

Within ten (10) days of the release, the permittee shall submit to the Department a full written explanation as to the cause of the release, the discovery of the release, response (clean-up and/or recovery) measures taken, and preventative measures taken or a schedule for completion of measures to be taken to prevent reoccurrence of similar releases.

8. Upset Noncompliance Notification

If a process "upset" (defined as an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee) has occurred, the permittee who wishes to establish the affirmative defense of upset, shall notify the Department by telephone within 24-hours of becoming aware of such conditions; and within five (5) days, provide in writing, the following information:

a. that an upset occurred and that the permittee can identify the specific cause(s) of the upset;

b. that the permitted wastewater treatment facility was, at the time, being properly operated; and

c. that the permittee has specified and taken action on all responsible steps to minimize or correct any adverse impact in the environment resulting from noncompliance with this permit.

In any enforcement proceedings, the permittee, seeking to establish the occurrence of an upset, has the burden of proof.

PART II

Section C. Reporting Requirements

9. 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 9.b. or 9.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 9.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 second 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 9.a., 9.b., 9.c., and 9.d., above. This provision does not relieve the permittee of any notification responsibilities under Part II.C.11. 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.

10. Bioaccumulative Chemicals of Concern (BCC)

Consistent with the requirements of Rules 323.1098 and 323.1215 of the Michigan Administrative Code, the permittee is prohibited from undertaking any action that would result in a lowering of water quality from an increased loading of a BCC unless an increased use request and antidegradation demonstration have been submitted and approved by the Department.

PART II

Section C. Reporting Requirements

11. Notification of Changes in Discharge

The permittee shall notify the Department, in writing, within 10 days of knowing, or having reason to believe, that any activity or change has occurred or will occur which would result in the discharge of: 1) detectable levels of chemicals on the current Michigan Critical Materials Register, priority pollutants or hazardous substances set forth in 40 CFR 122.21, Appendix D, or the Pollutants of Initial Focus in the Great Lakes Water Quality Initiative specified in 40 CFR 132.6, Table 6, which were not acknowledged in the application or listed in the application at less than detectable levels; 2) detectable levels of any other chemical not listed in the application or listed at less than detection, for which the application specifically requested information; or 3) any chemical at levels greater than five times the average level reported in the complete application (see the first page of this permit for the date(s) the complete application was submitted). Any other monitoring results obtained as a requirement of this permit shall be reported in accordance with the compliance schedules.

12. Changes in Facility Operations

Any anticipated action or activity, including but not limited to facility expansion, production increases, or process modification, which will result in new or increased loadings of pollutants to the receiving waters must be reported to the Department by a) submission of an increased use request (application) and all information required under Rule 323.1098 (Antidegradation) of the Water Quality Standards <u>or</u> b) by notice if the following conditions are met: 1) the action or activity will not result in a change in the types of wastewater discharged or result in a greater quantity of wastewater than currently authorized by this permit; 2) the action or activity will not result in violations of the effluent limitations specified in this permit; 3) the action or activity is not prohibited by the requirements of Part II.C.10.; and 4) the action or activity will not require notification pursuant to Part II.C.11. Following such notice, the permit may be modified according to applicable laws and rules to specify and limit any pollutant not previously limited.

13. 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.

14. Operations and Maintenance Manual

Part 41 of Act 451 of 1994, as amended, specifically Section 324.4104 and associated Rule 299.2957, allow the Department to require an Operations and Maintenance (O&M) manual for the wastewater treatment facility. An up-to-date copy of the O&M manual shall be kept at the wastewater treatment facility. Upon request a copy of the O&M manual shall be provided to the Department. The Department may review the manual in whole or in part at their discretion and require modifications to it if portions are determined to be inadequate.

At a minimum, the O&M manual should include the following information: permit standards, description and operation information for all equipment, staffing information, laboratory requirements, record keeping requirements, maintenance plan for equipment, emergency operating plan, safety program information and copies of all pertinent forms, as-built plans, and manufacturer's manuals.

Certification of the existence and accuracy of the operations and maintenance manual is required to be submitted to the Department at least sixty days prior to startup of a new wastewater treatment plant. Submittal of re-certifications will also be required sixty days prior to start up of any substantial improvements or modifications made at the wastewater treatment plant.

PART II

Section D. Management Responsibilities

1. Duty to Comply

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit.

It is the duty of the permittee to comply with all the terms and conditions of this permit. Any noncompliance with the Effluent Limitations, Special Conditions, or terms of this permit constitutes a violation of the Michigan Act and/or the Federal Act and constitutes grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of an application for permit renewal.

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

2. 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 Michigan Act. Permittees authorized to discharge storm water shall have the storm water treatment and/or control measures under direct supervision of a storm water operator certified by the Department, as required by Section 3110 of the Michigan Act.

3. 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.

4. 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.

5. Adverse Impact

The permittee shall take all reasonable steps to minimize any adverse impact to the surface waters or groundwaters of the state resulting from noncompliance with any effluent limitation specified in this permit including, but not limited to, such accelerated or additional monitoring as necessary to determine the nature and impact of the discharge in noncompliance.

PART II

Section D. Management Responsibilities

6. 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 Michigan Act.

7. Waste Treatment Residues

Residuals (i.e. solids, sludges, biosolids, filter backwash, scrubber water, ash, grit, or other pollutants or wastes) removed from or resulting from treatment or control of wastewaters, including those that are generated during treatment or left over after treatment or control has ceased, 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 Michigan Act, Part 31 for protection of water resources, Part 55 for air pollution control, Part 111 for hazardous waste management, Part 115 for solid waste management, Part 121 for liquid industrial wastes, Part 301 for protection of inland lakes and streams, and Part 303 for wetlands protection. Such disposal shall not result in any unlawful pollution of the air, surface waters or groundwaters of the state.

8. Right of Entry

The permittee shall allow the Department, any agent appointed by the Department or the Regional Administrator, 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 discharge of pollutants.

9. Availability of Reports

Except for data determined to be confidential under Section 308 of the Federal Act and Rule 2128 (Rule 323.2128 of the Michigan Administrative Code), all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Department and the Regional Administrator. As required by the Federal Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Federal Act and Sections 3112, 3115, 4106 and 4110 of the Michigan Act.

PART II

Section E. Activities Not Authorized by This Permit

1. Discharge to the Groundwaters

This permit does not authorize any discharge to the groundwaters. Such discharge may be authorized by a groundwater discharge permit issued pursuant to the Michigan Act.

2. POTW Construction

This permit does not authorize or approve the construction or modification of any physical structures or facilities at a POTW. Approval for the construction or modification of any physical structures or facilities at a POTW must be by permit issued under Part 41 of the Michigan Act.

3. Civil and Criminal Liability

Except as provided in permit conditions on "Bypass" (Part II.C.9. pursuant to 40 CFR 122.41(m)), nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance, whether or not such noncompliance is due to factors beyond the permittee's control, such as accidents, equipment breakdowns, or labor disputes.

4. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee may be subject under Section 311 of the Federal Act except as are exempted by federal regulations.

5. State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by Section 510 of the Federal Act.

6. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other Department of Natural Resources and Environment permits, or approvals from other units of government as may be required by law.

Appendix F

SHPO Correspondence

received G

DEC 2 4 2012

Prein&Newhof

STATE OF MICHIGAN

RICK SNYDER
GOVERNOR

MICHIGAN STATE HOUSING DEVELOPMENT AUTHORITY
STATE HISTORIC PRESERVATION OFFICE

SCOTT WOOSLEY
EXECUTIVE DIRECTOR

December 13, 2012

SONYA T BUTLER
SECTION CHIEF RLOCS
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
P O BOX 30273
LANSING MI 48909

RE: ER13-85 Charlevoix Waste Water Treatment Plant Improvements, T34N, R8W, S28, 15116 Lake Shore Drive, Charlevoix Township, Charlevoix County (EPA)

Dear Ms. Butler

Under the authority of Section 106 of the National Historic Preservation Act of 1966, as amended, we have reviewed the above-cited undertaking at the location noted above. Based on the information provided for our review, it is the opinion of the State Historic Preservation Officer (SHPO) that **no historic properties are affected** within the area of potential effects of this undertaking.

The views of the public are essential to informed decision making in the Section 106 process. Federal Agency Officials or their delegated authorities must plan to involve the public in a manner that reflects the nature and complexity of the undertaking, its effects on historic properties and other provisions per 36 CFR § 800.2(d). We remind you that Federal Agency Officials or their delegated authorities are required to consult with the appropriate Indian tribe and/or Tribal Historic Preservation Officer (THPO) when the undertaking may occur on or affect any historic properties on tribal lands. **In all cases**, whether the project occurs on tribal lands or not, Federal Agency Officials or their delegated authorities are also required to make a reasonable and good faith effort to identify any Indian tribes or Native Hawaiian organizations that might attach religious and cultural significance to historic properties in the area of potential effects and invite them to be consulting parties per 36 CFR § 800.2(c-f).

This letter evidences the EPA's compliance with 36 CFR § 800.4 "Identification of historic properties", and the fulfillment of the EPA's responsibility to notify the SHPO, as a consulting party in the Section 106 process, under 36 CFR § 800.4(d)(1) "No historic properties affected."

The State Historic Preservation Office is not the office of record for this undertaking. You are therefore asked to maintain a copy of this letter with your environmental review record for this undertaking. If the scope of work changes in any way, or if artifacts or bones are discovered, please notify this office immediately.

If you have any questions, please contact Brian Grennell, Cultural Resource Management Specialist, at (517) 335-2721 or by email at grennellb@michigan.gov. **Please reference our project number in all communication with this office regarding this undertaking.** Thank you for this opportunity to review and comment, and for your cooperation.

Sincerely,

Brian G. Grennell
Cultural Resource Management Specialist

for Brian D. Conway
State Historic Preservation Officer

BGG:SAT:ses

Copy: Kevil L. Gritters, Prein&Newhof

Prein&Newhof
Engineers ▪ Surveyors ▪ Environmental ▪ Laboratory

November 27, 2012
2110372

State Historic Preservation Office
Environmental Review Office
Michigan Historical Center
702 W. Kalamazoo Street
P.O. Box 30740
Lansing, MI 48909-8240

RE: Michigan Revolving Loan Fund Project – City of Charlevoix, MI
Wastewater Treatment Plant Improvements

To Whom It May Concern:

On behalf of the City of Charlevoix, Prein&Newhof is submitting information for your review as part of the environmental review process required for a Project Plan. This Project Plan will be used to place this project on the State's Wastewater Revolving Fund Priority List to qualify for a low interest loan. Improvements are proposed to the City of Charlevoix's existing Wastewater Treatment Plant as located on the attached maps.

The proposed City of Charlevoix Wastewater Treatment Plant Improvements work activities are confined to the existing wastewater treatment plant site. Ground disturbance will be limited to the area bounded by the perimeter security fence and will not impact any previously unaltered areas.

The treatment plant originally was constructed in 1972, and many of its components have reached or are nearing the end of their useful life. Activities necessary to continue to provide the required level of service and to meet all permits and regulations include the following:

1) Renovation of the existing screen building, chemical building, and service building, and construction of a new administration/electrical building.
2) Rehabilitation of the existing tanks and digesters and construction of a new tank(s);
3) Replacement of the underground yard piping throughout the site;
4) Installation of a new standby generator;
5) Installation of a SCADA system for plant monitoring and control.

The proposed project is located in Town 34N, Range 08W, Section 28, in Charlevoix Township.

Our goal is to submit the Project Plan by December 18, 2012. We would appreciate it if you could respond as quickly as possible to this request for environmental review so that we might include the correspondence with the Project Plan. We request that any comments or clearances be copied to the Water/Wastewater Revolving Loan and Operator Certification Section, MDEQ Environmental Science and Services Division, PO Box 30457, Lansing, MI 48909-7957.

3355 Evergreen Drive NE Grand Rapids, MI 49525 t. 616-364-8491 f. 616-364-6955 www.preinnewhof.com

We appreciate your timely review of this matter. If you have any questions, please feel free to contact our office at (616) 364-8491.

Sincerely,

Prein&Newhof

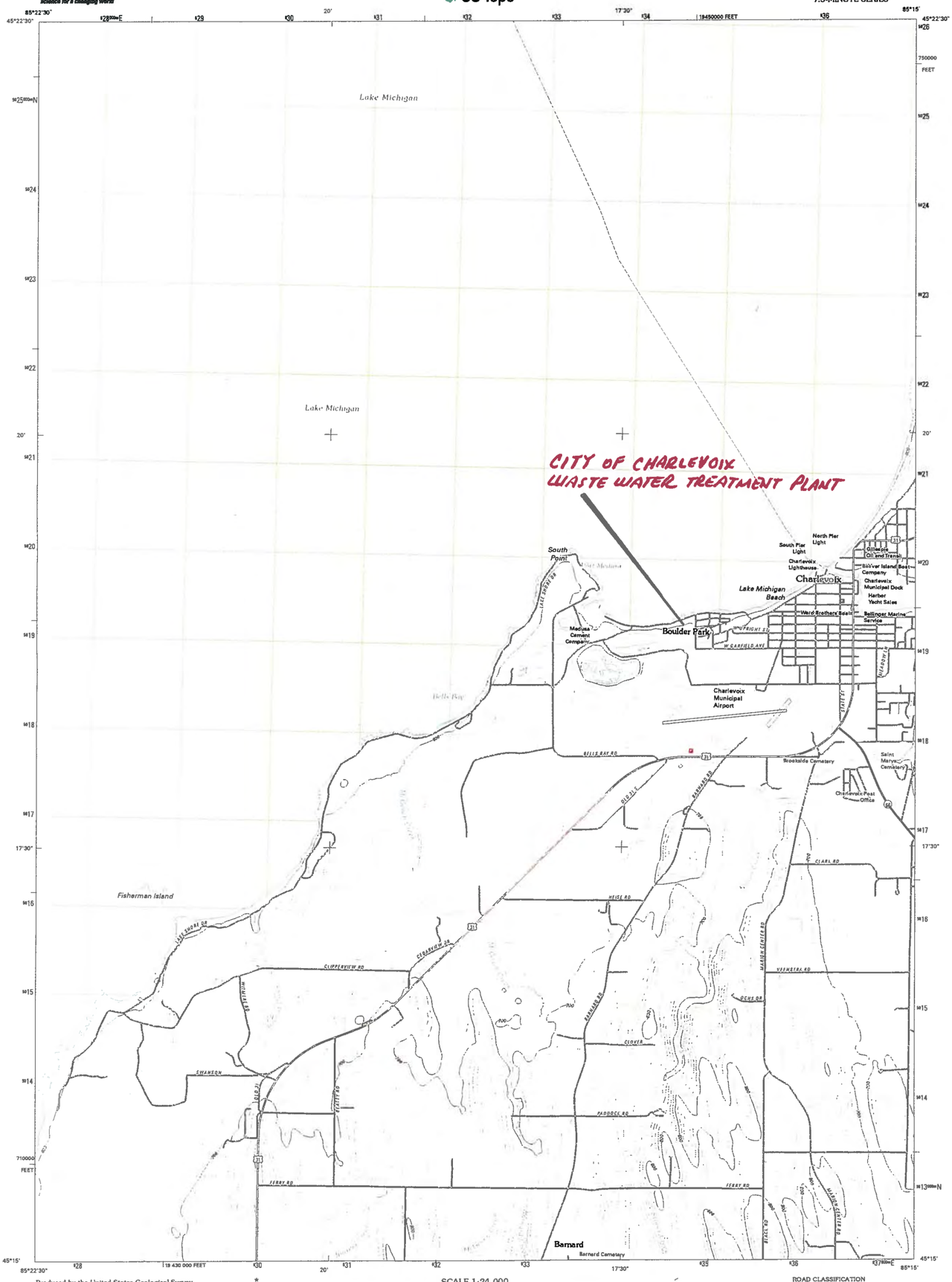
Kevin L. Gritters, P.E

Enclosure(s): USGS Charlevoix Quadrangle – Location Map
Orthophotography Aerial Map – Site Map
Application for a Section 106 Review and Map
Project Work Description
Project Photographs

U.S. DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY

The National Map US Topo

CHARLEVOIX QUADRANGLE
MICHIGAN-CHARLEVOIX CO.
7.5-MINUTE SERIES



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and 1 000-meter grid: Universal Transverse Mercator, Zone 16T
10 000-foot ticks: Michigan Coordinate System of 1983 (central zone)

Imagery....NAIP, July 2009 - September 2009
Roads....©2005-2010 Tele Atlas
Names....GNIS, 2010
Hydrography....National Hydrography Dataset, 2009
Contours....National Elevation Dataset, 1999
Boundaries....Census, ESRI, IDC, USGS, 1972 - 2010

MN 6° 18' W 11.2 MILS
GN 1° 12' 21 MILS
UTM GRID AND 2011 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000-m Square KJ
PR
Grid Zone Designation 16T

SCALE 1:24 000

KILOMETERS 1 0.5 0 1 2
METERS 1000 500 0 1000 2000
MILES 1 0.5 0 1
FEET 1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

CONTOUR INTERVAL 20 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with version 0.5.10 of the USGS US Topo Product Standard.
A metadata file associated with this product is draft version 0.5.16

MICHIGAN
QUADRANGLE LOCATION

Charlevoix OE W	Charlevoix	Ironton
Atwood OE W	Atwood	Ellsworth

ADJOINING 7.5' QUADRANGLES

ROAD CLASSIFICATION

Interstate Route
US Route
Ramp
State Route
Local Road
4WD

Interstate Route
US Route
State Route

CHARLEVOIX, MI
2011

ORTHO AERIAL MAPS

Showing Parcel Lines & Labels and Soil Lines and Labels

CITY OF CHARLEVOIX WASTEWATER TREATMENT PLANT SITE

Digital Orthophotographs

"The orthophotography provided was obtained for Charlevoix County during late April of 2010. The entire mainland portion of the County was acquired (including 343 square miles) and Beaver Island (including an additional 57 square miles) for a total covered area of 400 square miles or 256,000 acres. The prefix "ortho" in the word orthophotography implies that the scale of the photo is constant throughout the image. Therefore, if we take several measurements of the same distance between any points on the photo (digital image) you will find the same ground distance is represented in each of the measurements. This is referred to as a consistent map scale where the measurement qualities of a traditional map are essentially conveyed to the digital image. We can therefore accurately measure area and distance simply by using the measurement tools provided in the web mapping display you currently are using to view the aerial imagery. For more information about this project and its technical details please contact the County GIS Coordinator."

N 250 US Feet

- Digital Orthophotograph
- County Border
- Municipal Border
- Municipal Name
- Public Roads
- Property Lines
- Mapped Soils

AREA OF POTENTIAL EFFECTS

Copyright © 2012 Land Information Access Association

STATE HISTORIC PRESERVATION OFFICE
Application for Section 106 Review

SHPO Use Only					
☐ IN	Received Date	____ / ____ / ____	Log In Date	____ / ____ / ____
☐ OUT	Response Date	____ / ____ / ____	Log Out Date	____ / ____ / ____
	Sent Date	____ / ____ / ____		

Submit one copy for each project for which review is requested. This application is required. Please type. Applications must be complete for review to begin. Incomplete applications will be sent back to the applicant without comment. Send only the information and attachments requested on this application. Materials submitted for review cannot be returned. Due to limited resources we are unable to accept this application electronically.

I. GENERAL INFORMATION

☒ THIS IS A NEW SUBMITTAL ☐ THIS IS MORE INFORMATION RELATING TO ER#

a. Project Name: City of Charlevoix - Wastewater Treatment Plant Improvements
b. Project Address (if available): 15116 Lake Shore Drive, Charlevoix MI 49720
c. Municipal Unit: Charlevoix Township County: Charlevoix
d. Federal Agency, Contact Name and Mailing Address (*If you do not know the federal agency involved in your project please contact the party requiring you to apply for Section 106 review, not the SHPO, for this information.*):
e. State Agency (if applicable), Contact Name and Mailing Address: MDEQ, Ms. Sonya Butler, Supv. - Revolving Loan Section, Constitution Hall, 3 South, 525 W. Allegan Street, P.O. Box 30241, Lansing MI 48909-7741
f. Consultant or Applicant Contact Information (if applicable) *including mailing address*: Kevin L. Gritters, P.E. Prein&Newhof, 3355 Evergreen Dr. NE, Grand Rapids, MI 49525. Tel. # (616) 364-8491.

II. GROUND DISTURBING ACTIVITY (INCLUDING EXCAVATION, GRADING, TREE REMOVALS, UTILITY INSTALLATION, ETC.)

DOES THIS PROJECT INVOLVE GROUND-DISTURBING ACTIVITY? ☒ YES ☐ NO (If no, proceed to section III.)

Exact project location must be submitted on a USGS Quad map (portions, photocopies of portions, and electronic USGS maps are acceptable as long as the location is clearly marked).

a. USGS Quad Map Name: Charlevoix, MI
b. Township: 34N Range: 08W Section: 28
c. Description of width, length and depth of proposed ground disturbing activity: See Attached APE. The proposed project activity is confined to the existing Wastewater Treatment Plant site. All ground disturbances will occur within the footprint of the existing facility or in currently maintained lawn areas that previously have been disturbed. The work will be contained within the perimeter security fence with a maximum disturbed area of approximately 500 feet long and 300 feet wide. Underground work will extend to a maximum depth of about 20 feet, which is the depth of the existing buildings, tanks, and yard piping.
d. Previous land use and disturbances: Wastewater treatment plant site; facility constructed in 1972.
e. Current land use and conditions: Wastewater treatment plant site. Site and grounds in good condition.
f. Does the landowner know of any archaeological resources found on the property? ☐ YES ☒ NO
Please describe:

III. PROJECT WORK DESCRIPTION AND AREA OF POTENTIAL EFFECTS (APE)
Note: Every project has an APE.

a. Provide a detailed written description of the project (plans, specifications, Environmental Impact Statements (EIS), Environmental Assessments (EA), etc. **cannot** be substituted for the written description): The existing Wastewater Treatment Plant was constructed in 1972, and many of its components have reached or are nearing the end of their useful life. Activities necessary to continue to provide the required level of service and to meet all permits and regulations include the following: 1) Renovation of the existing screen building, chemical building, and service building, and construction of a new administration/electrical building. This will include work inside the existing buildings.

Construction of a new administration/electrical building will include removal of topsoil, excavation, pouring a concrete foundation and construction of the building. This work will be done in ground that was disturbed during construction of the original treatment facility.
2) Rehabilitation of the existing tanks and digesters and construction of a new tank(s). This work will take place inside the existing settling tanks, aeration tanks, chemical tank, and digesters. Construction of a new tank will consist of topsoil removal, excavation and pouring concrete for the tank foundation and walls. The new tank(s) will be located in an area that was disturbed during construction of the original plant and that has been maintained as lawn area.
3) Replacement of the underground yard piping throughout the site. This work will include topsoil removal, excavation to and replacement of the underground yard piping on the site as necessary to facilitate the wastewater treatment process.
4) Installation of a new standby generator will include stripping topsoil, pouring a concrete pad, trenching on the existing site for electrical conduits, and placement of a permanent, standby generator.
5) Installation of a SCADA system for monitoring and control of the treatment facility. This work will consist of installing monitoring equipment, trenching for electrical conduits, and installing control panels and other electrical equipment in existing and proposed buildings.

b. Provide a localized map indicating the location of the project; road names must be included and legible.
c. On the above-mentioned map, identify the APE. See map.
d. Provide a written description of the APE (physical, visual, auditory, and sociocultural), the steps taken to identify the APE, and the justification for the boundaries chosen. The improvements at the City of Charlevoix Wastewater Treatment Plant will have an impact only on the immediate area of existing Wastewater Treatment Plant. The physical area within the existing perimeter fence will be the only area affected by construction. The construction will create only minor inconveniences for residents in the area. Construction operations will be maintained in a clean and neat manner to minimize the visual effects of the work. There may be noise and dust problems which can be mitigated with effective construction operations. A secondary effect of the construction may be temporary traffic impacts as construction equipment accesses and traverses the site. Effective signage will mitigate these impacts.

IV. IDENTIFICATION OF HISTORIC PROPERTIES

a. List and date **all** properties 50 years of age or older located in the APE. If the property is located within a National Register eligible, listed or local district it is only necessary to identify the district: None found. The proposed project site is on City of Charlevoix property. The closest adjacent structure is nearly two hundred feet away from the treatment plant and will not be impacted in any way.
b. Describe the steps taken to identify whether or not any **historic** properties exist in the APE and include the level of effort made to carry out such steps: The Michigan Historic Sites website was consulted and no sites were found in or near the Project area. Other than the existing wastewater treatment facility, there are no structures in the APE. However, the project area was driven and no other structures in the area appeared to be historic or built prior to the 1960s.
c. Based on the information contained in "b", please choose one:
   - ☐ Historic Properties Present in the APE
   - ☒ No Historic Properties Present in the APE
d. Describe the condition, previous disturbance to, and history of any historic properties located in the APE: N/A

V. PHOTOGRAPHS

Note: All photographs must be keyed to a localized map.

a. Provide photographs of the site itself. Photographs of the Project site are attached.
b. Provide photographs of all properties 50 years of age or older located in the APE (faxed or photocopied photographs are not acceptable). None of the properties appear to be 50 years or older.

VI. DETERMINATION OF EFFECT

☒ No historic properties affected based on [36 CFR § 800.4(d)(1)], please provide the basis for this determination.

☒ No Adverse Effect [36 CFR § 800.5(b)] on historic properties, explain why the criteria of adverse effect, 36 CFR Part 800.5(a)(1), were found not applicable.

☐ Adverse Effect [36 CFR § 800.5(d)(2)] on historic properties, explain why the criteria of adverse effect, [36 CFR Part 800.5(a)(1)], were found applicable.

Please print and mail completed form and required information to:

State Historic Preservation Office, Environmental Review Office, Michigan Historical Center, 702 W. Kalamazoo Street, P.O. Box 30740, Lansing, MI 48909-8240

City of Charlevoix
Wastewater Treatment Plant Improvements
SRF Project Plan
2110372

Project Work Description

The proposed City of Charlevoix Wastewater Treatment Plant Improvements work activities are confined to the existing wastewater treatment plant site. Ground disturbance will be limited to the area bounded by the perimeter security fence and will not impact any previously unaltered areas.

The treatment plant originally was constructed in 1972, and many of its components have reached or are nearing the end of their useful life. Activities necessary to continue to provide the required level of service and to meet all permits and regulations include the following:

1) Renovation of the existing screen building, chemical building, and service building, and construction of a new administration/electrical building.
2) Rehabilitation of the existing tanks and digesters and construction of a new tank(s);
3) Replacement of the underground yard piping throughout the site;
4) Installation of a new standby generator;
5) Installation of a SCADA system for plant monitoring and control.

The proposed project is located in Town 34N, Range 08W, Section 28, in Charlevoix Township.

2110372 Photographic log of City of Charlevoix Wastewater Treatment Plant project site, Charlevoix County, Michigan. Photographs taken July 13, 2012.

WWTP Site – Photograph Key.

2110372 Photographic log of City of Charlevoix Wastewater Treatment Plant project site, Charlevoix County, Michigan. Photographs taken July 13, 2012.

Photo 1. View of Screen Building, looking West-Southwest.

Photo 2. View of Aeration Tanks and Service Building, looking North.

2110372 Photographic log of City of Charlevoix Wastewater Treatment Plant project site, Charlevoix County, Michigan. Photographs taken July 13, 2012.

Photo 3. View from Final Settling Tank No. 1, looking South, of Service Building (left foreground), Aeration Tanks (right foreground) and Screen Building (beyond).

Photo 4. View of Chlorine Contact Tank, looking North-Northwest.

2110372 Photographic log of City of Charlevoix Wastewater Treatment Plant project site, Charlevoix County, Michigan. Photographs taken July 13, 2012.

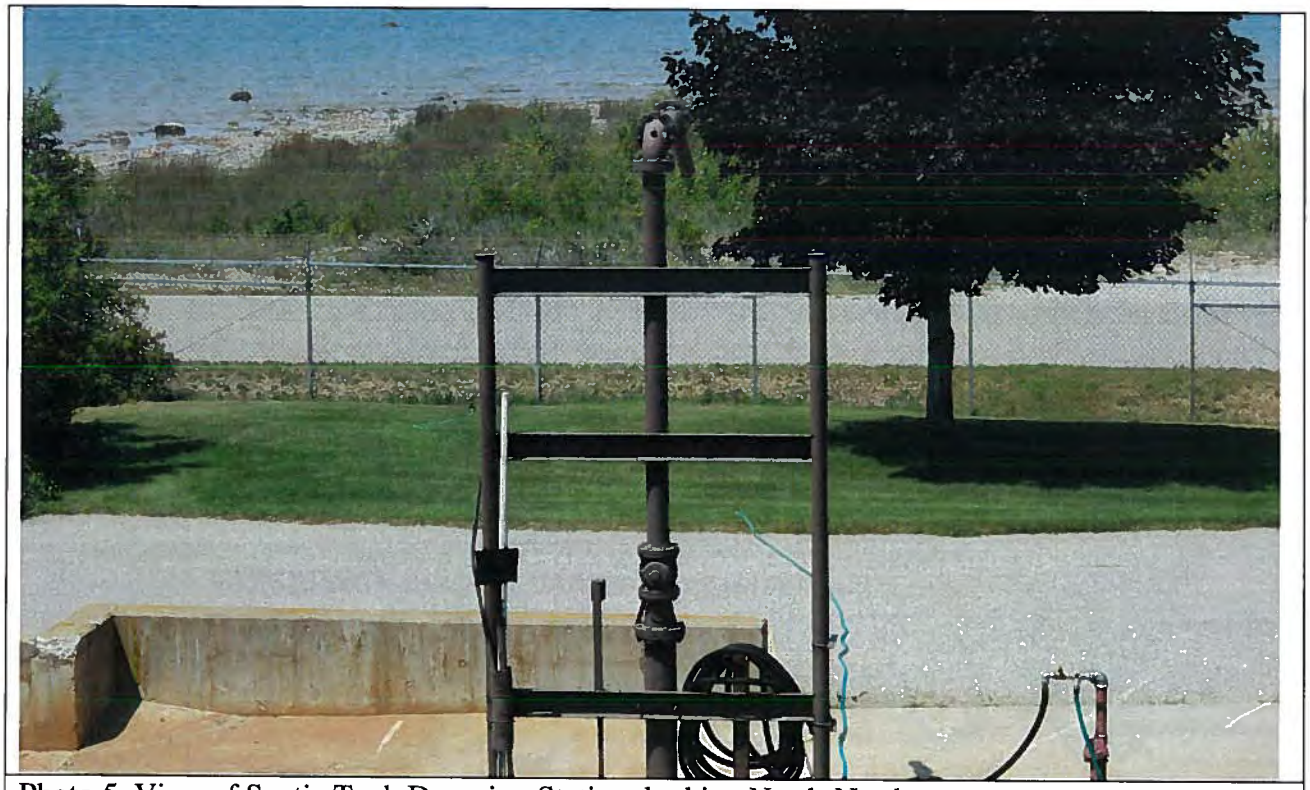


Photo 5. View of Septic Tank Dumping Station, looking North-Northwest.

Photo 6. View of Sludge Drying Beds, looking West.

2110372 Photographic log of City of Charlevoix Wastewater Treatment Plant project site, Charlevoix County, Michigan. Photographs taken July 13, 2012.

Photo 7. View of Sludge Drying Beds, looking West-Southwest.

Appendix G

THPO Correspondence

received G
NOV 2 9 2012
Prein&Newhof

Little River Band of Ottawa Indians
Tribal Historic Preservation
375 River Street
Manistee, MI 49660
1-888-723-8288

November 27, 2012

Prein & Newhof
3355 Evergreen Drive
Grand Rapids, MI 49525

Dear Mr. Gritters;

The Tribe has received your Letter of Nov. 21 2012 referencing the Michigan Revolving Loan Fund Project – City of Charlevoix, MI, Wastewater Treatment Plant Improvements and requesting a determination as to whether or not the proposed projects will affect Indian religious sites. Thank you for ensuring that we received notification. This letter is the Tribe's formal answer to your request.

In reply to the above cited letter, I can reply by stating that the sites listed are located in a region of the state of Michigan that Little River Band of Ottawa Indians did not occupy significantly. Further, after a careful review of our information the Little River Band of Ottawa Indians has determined there that these projects will not affect any religious, cultural or historic Little River Band of Ottawa Indians sites of which we are currently aware.

The Tribe would, however, appreciate work stopping and being contacted should there be something of a cultural, religious or historic nature discovered so as to assist in mitigation of the discovered site.

Signed

Jonnie Sam II, Director
Historic Preservation Department
Little River Band of Ottawa Indians

Prein&Newhof
Engineers ▪ Surveyors ▪ Environmental ▪ Laboratory

November 21, 2012
2110372

Mr. Curtis Chambers
Burt Lake Band of Ottawa & Chippewa Indians
6461 Brutus Road
Brutus, MI 49716

Mr. Jay Sam
Little River Band of Ottawa Indians
375 River Street
Manistee, MI 49660

Mr. Ron Yob
Grand River Band of Ottawa Indians
1251 Plainfield NE Suite B
Grand Rapids, MI 49501

Mr. Eric Hemenway /
Gijigowi Bipskaabiimii
7500 Odawa Circle
Harbor Springs, MI 49740

Mr. Mark E. Russell
Grand Traverse Band of Ottawa and Chippewa Indians
2605 NW Bayshore Drive
Peshawbetown, MI 49682

RE: Michigan Revolving Loan Fund Project – City of Charlevoix, MI
Wastewater Treatment Plant Improvements

To Whom It May Concern:

On behalf of the City of Charlevoix, Prein&Newhof is submitting information for your review as part of the environmental review process required for a Project Plan. This Project Plan will be used to place this project on the State's Wastewater Revolving Fund Priority List to qualify for a low interest loan. Improvements are proposed to the City of Charlevoix's existing Wastewater Treatment Plant as located on the attached maps.

The proposed City of Charlevoix Wastewater Treatment Plant Improvements work activities are confined to the existing wastewater treatment plant site. Ground disturbance will be limited to the area bounded by the perimeter security fence and will not impact any previously unaltered areas.

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2) Rehabilitation of the existing tanks and digesters and construction of a new tank(s);
3) Replacement of the underground yard piping throughout the site;
4) Installation of a new standby generator;
5) Installation of a SCADA system for plant monitoring and control.

3355 Evergreen Drive NE Grand Rapids, MI 49525 t. 616-364-8491 f. 616-364-6955 www.preinnewhof.com

The proposed project is located in Town 34N, Range 08W, Section 28, in Charlevoix Township.

Our goal is to submit the Project Plan by December 18, 2012. We would appreciate it if you could respond as quickly as possible to this request for environmental review so that we might include the correspondence with the Project Plan. We request that any comments or clearances be copied to the Water/Wastewater Revolving Loan and Operator Certification Section, MDEQ Environmental Science and Services Division, PO Box 30457, Lansing, MI 48909-7957.

We appreciate your timely review of this matter. If you have any questions, please feel free to contact our office at (616) 364-8491.

Sincerely,

Prein&Newhof

Kevin L. Gritters, P.E

Enclosure(s): USGS Charlevoix Quadrangle – Location Map
Orthophotography Aerial Map – Site Map

Appendix H

NWMCOG Correspondence

Let Our Resources Work For You.

Northwest Michigan Council of Governments

Workforce • Business • Community

Chairman: **Larry C. Inman**

Workforce Development Board Chairman: **David R. Adams**

Chief Executive Officer: **Elaine Wood**

Tuesday, November 27, 2012

Mr. Kevin L. Gritters, P.E.
Prein & Newhof
Engineers-Surveyors-Environmental-Laboratory
3355 Evergreen Drive NE
Grand Rapids, MI 49525

RE: Application for Project Plan: Michigan Revolving Loan Fund Project – City of Charlevoix, Michigan
"Wastewater Treatment Plant Improvements"

Dear Mr. Gritters:

The Northwest Michigan Council of Governments (NWMCOG), in its capacity as the designated federal funding clearinghouse for northwest Lower Michigan, has received a copy of the application for the above-mentioned program. **The NWMCOG does not believe that the funding request nor its implementation, negatively impacts any NWMCOG policies, plans, or programs.** We will file your submittal and forward a copy of this letter to the funding agency to which the application was directed to and to the Single Point of Contact State of Michigan Clearinghouse.

Per the Executive Order regarding Intergovernmental Review of Federal Programs (E.O. 12372), the funding agency may require the NWMCOG to determine potential impacts on other local and regional planning efforts in northwest lower Michigan. If you are unsure if such a requirement exists relative to your request, go to the Catalog of Federal Domestic Assistance website: www.cfda.gov. Insert program number (e.g. 93.243) in to the search engine box on the right side bar – click – and follow prompts to the icon for the funding program descriptions. Click on the icon and scroll down to "Application Award Process." If your funding program is not included in the catalog, you may have to go to the funding agency's website or contact an agency representative.

If the funding agency does not require further review, no further action is required by the NWMCOG. If the funding agency is requiring formal intergovernmental review, please contact Matt McCauley, Director of Regional Planning & Community Development at mccauley@nwm.cog.mi.us or 231-929-5061 to determine what exactly will be needed to satisfy the requirements of the funding agency.

Thank you for contacting the NWMCOG.

Sincerely,

Elaine Wood

Elaine Wood
Chief Executive Officer

CC: State of Michigan Clearinghouse
Water/Wastewater Revolving Loan & Operator Certification Section

received G
DEC 03 2012
Prein&Newhof

Northwest Michigan Council of Governments is an Equal Opportunity Employer/Program. Auxiliary aids and service are available upon request to individuals with disabilities. Michigan Relay Center callers use 711 or 1-800-649-3777.

Prein&Newhof
Engineers ▪ Surveyors ▪ Environmental ▪ Laboratory

November 21, 2012
2110372

Northwest Michigan Council of Governments
PO Box 506
Traverse City, MI 49685

RE: Michigan Revolving Loan Fund Project – City of Charlevoix, MI
Wastewater Treatment Plant Improvements

To Whom It May Concern:

On behalf of the City of Charlevoix, Prein&Newhof is submitting information for your review as part of the environmental review process required for a Project Plan. This Project Plan will be used to place this project on the State's Wastewater Revolving Fund Priority List to qualify for a low interest loan. Improvements are proposed to the City of Charlevoix's existing Wastewater Treatment Plant as located on the attached maps.

The proposed City of Charlevoix Wastewater Treatment Plant Improvements work activities are confined to the existing wastewater treatment plant site. Ground disturbance will be limited to the area bounded by the perimeter security fence and will not impact any previously unaltered areas.

The treatment plant originally was constructed in 1972, and many of its components have reached or are nearing the end of their useful life. Activities necessary to continue to provide the required level of service and to meet all permits and regulations include the following:

1) Renovation of the existing screen building, chemical building, and service building, and construction of a new administration/electrical building.
2) Rehabilitation of the existing tanks and digesters and construction of a new tank(s);
3) Replacement of the underground yard piping throughout the site;
4) Installation of a new standby generator;
5) Installation of a SCADA system for plant monitoring and control.

The proposed project is located in Town 34N, Range 08W, Section 28, in Charlevoix Township.

Our goal is to submit the Project Plan by December 18, 2012. We would appreciate it if you could respond as quickly as possible to this request for environmental review so that we might include the correspondence with the Project Plan. We request that any comments or clearances be copied to the Water/Wastewater Revolving Loan and Operator Certification Section, MDEQ Environmental Science and Services Division, PO Box 30457, Lansing, MI 48909-7957.

We appreciate your timely review of this matter. If you have any questions, please feel free to contact our office at (616) 364-8491.

3355 Evergreen Drive NE Grand Rapids, MI 49525 t. 616-364-8491 f. 616-364-6955 www.preinnewhof.com

Sincerely,

Prein&Newhof

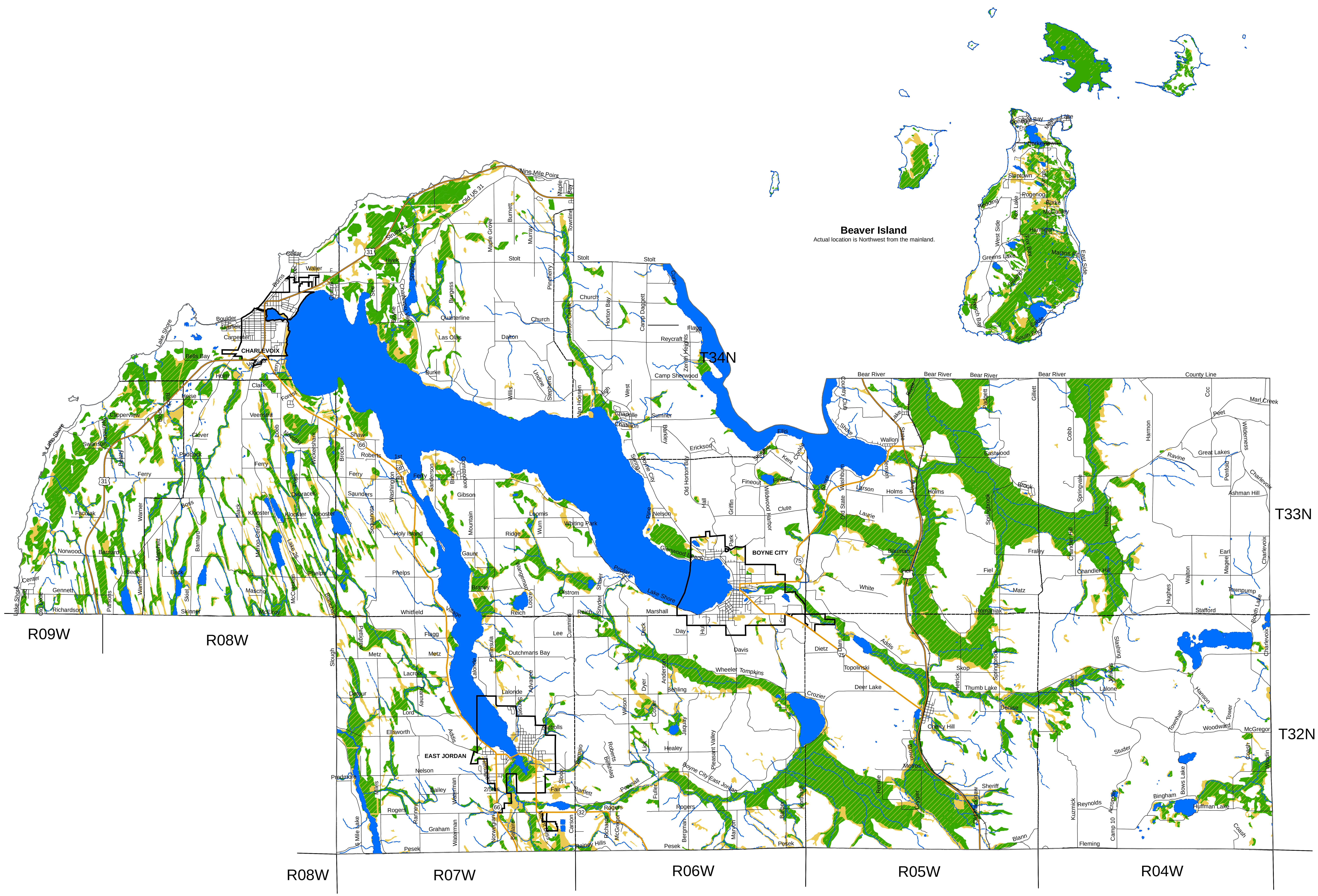
Kevin L. Gritters, P.E

Enclosure(s): USGS Charlevoix Quadrangle – Location Map
Orthophotography Aerial Map – Site Map

Appendix I

Wetlands Maps

Charlevoix County Final Wetland Inventory



Charlevoix County

Final Wetland Inventory

This Michigan Department of Environmental Quality (MDEQ) Wetland Inventory Map is intended to be used as one tool to assist in identifying wetlands and provides only potential and approximate location of wetlands and wetland conditions. The MDEQ produced this map from the following data obtained from other agencies or organizations:

1. The National Wetland Inventory (NWI) conducted by the United States Fish and Wildlife Service through interpretation of aerial photos and topographic data.
2. Land Cover as mapped by the Michigan Resource Inventory System (MIRIS), Michigan Department of Natural Resources, through interpretation of aerial photographs.
3. Soils as mapped by the United States Department of Agriculture, Natural Resource Conservation Service (NRCS).

This map is not intended to be used to determine the specific locations and jurisdictional boundaries of wetland areas subject to regulation under Part 303, Wetlands Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Only an on-site evaluation performed by the MDEQ in accordance with Part 303 shall be used for jurisdictional determinations. A permit is required from the MDEQ to conduct certain activities in wetlands regulated under Part 303.

More information regarding this map, including how to obtain a copy can be accessed at www.michigan.gov/deqwetlands.

Miles
0 0.5 1 2 3 4

Legend

- Interstate Highways
- US Highways
- State Highways
- Railways
- Open Water
- Rivers
- Drains
- Wetlands as identified on NWI and MIRIS maps
- Soil areas which include wetland soils
- Wetlands as identified on NWI and MIRIS maps and soil areas which include wetland soils
- County Boundary

N
W E
S

Areas shown as wetlands, wetland soils, or open water on the map are potential wetlands and deserve further site investigation to verify if wetlands are actually present. This map may not identify all potential wetlands in a county (it may show wetlands that are not actually present and it may not show wetlands which are actually present). This map represents existing information that suggests the probability that a wetland may or may not exist in a given area and cannot be used to identify regulatory jurisdiction.

Compiled by MDEQ October 26, 2006.

Wetlands Map Viewer
Print page

City of Charlevoix Wastewater Treatment Plant

Wetlands as identified on NWI and MIRIS maps

Soil areas which include wetland soils

Wetlands as identified on NWI and MIRIS maps and soil areas which include wetland soils

Base Map Legend

- Unincorporated Places
- Interchanges
- Political Boundaries
- FREEWAY
- HIGHWAY
- Primary Roads
- Local Road Names
- Railroads
- County Names
- Lakes
- Rivers
- City, Village, CDP
- County Boundaries

This map is not intended to be used to determine the specific locations and jurisdictional boundaries of wetland areas subject to regulation.
More information regarding this map, including how to obtain a copy can be accessed at www.michigan.gov/wetlands
Copyright © 2001-2012 State of Michigan

Sections

Town Range

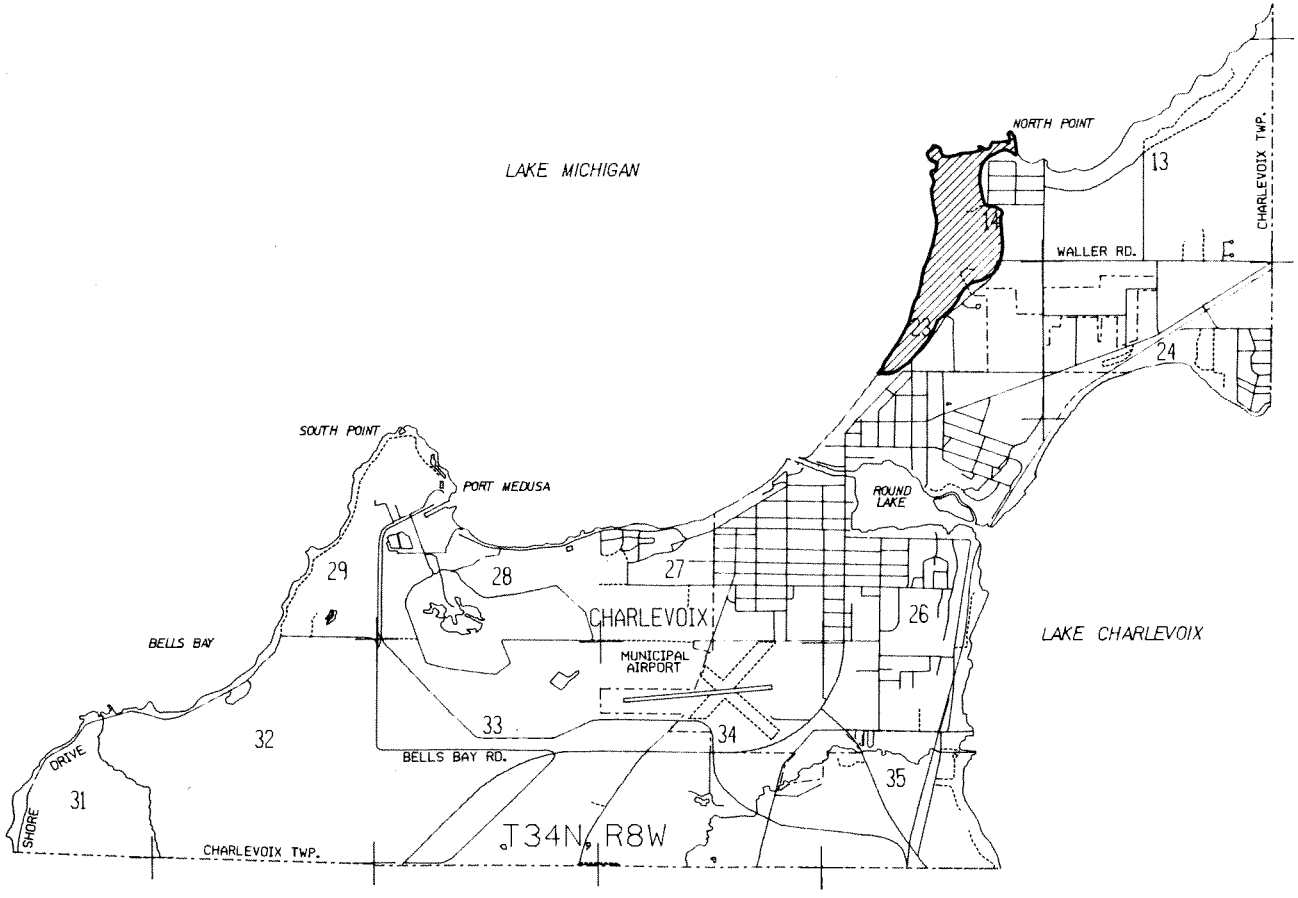
Public Land Survey System - Sections Extended

Appendix J

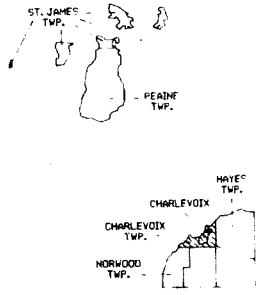
Critical Dunes Map

CHARLEVOIX TOWNSHIP

CRITICAL DUNE AREAS



CHARLEVOIX COUNTY



LEGEND

POLITICAL JURISDICTIONS

BOUNDARIES OF COUNTIES, TOWNSHIPS, AND INCORPORATED CITIES AND VILLAGES AS OF 1987.

PUBLIC LANDS

STATE AND FEDERAL LANDS AND MAJOR LOCAL PARKS WITHIN CRITICAL DUNE AREAS. PUBLIC LANDS ARE CURRENT AS OF 1986.

PROPOSED CRITICAL DUNE AREAS

BARRIER DUNES

BARRIER DUNE FORMATIONS DESIGNATED PURSUANT TO 1976 P.A. 222

AREAS NOT INCLUDED IN DESIGNATED BARRIER DUNE FORMATIONS THAT ARE COMPOSED PRIMARILY OF DUNE SAND AND EXHIBIT SEVERAL DUNE-LIKE CHARACTERISTICS.

EXEMPLARY DUNE ASSOCIATED PLANT COMMUNITIES OUTSIDE DESIGNATED DUNE FORMATIONS. MICHIGAN NATURAL FEATURES INVENTORY REFERENCE CODE INDICATED.

INFORMATION

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
LAND AND WATER MANAGEMENT DIVISION
P.O. BOX 30028
LANSING, MI 48909
(517) 373-1170

GLIS

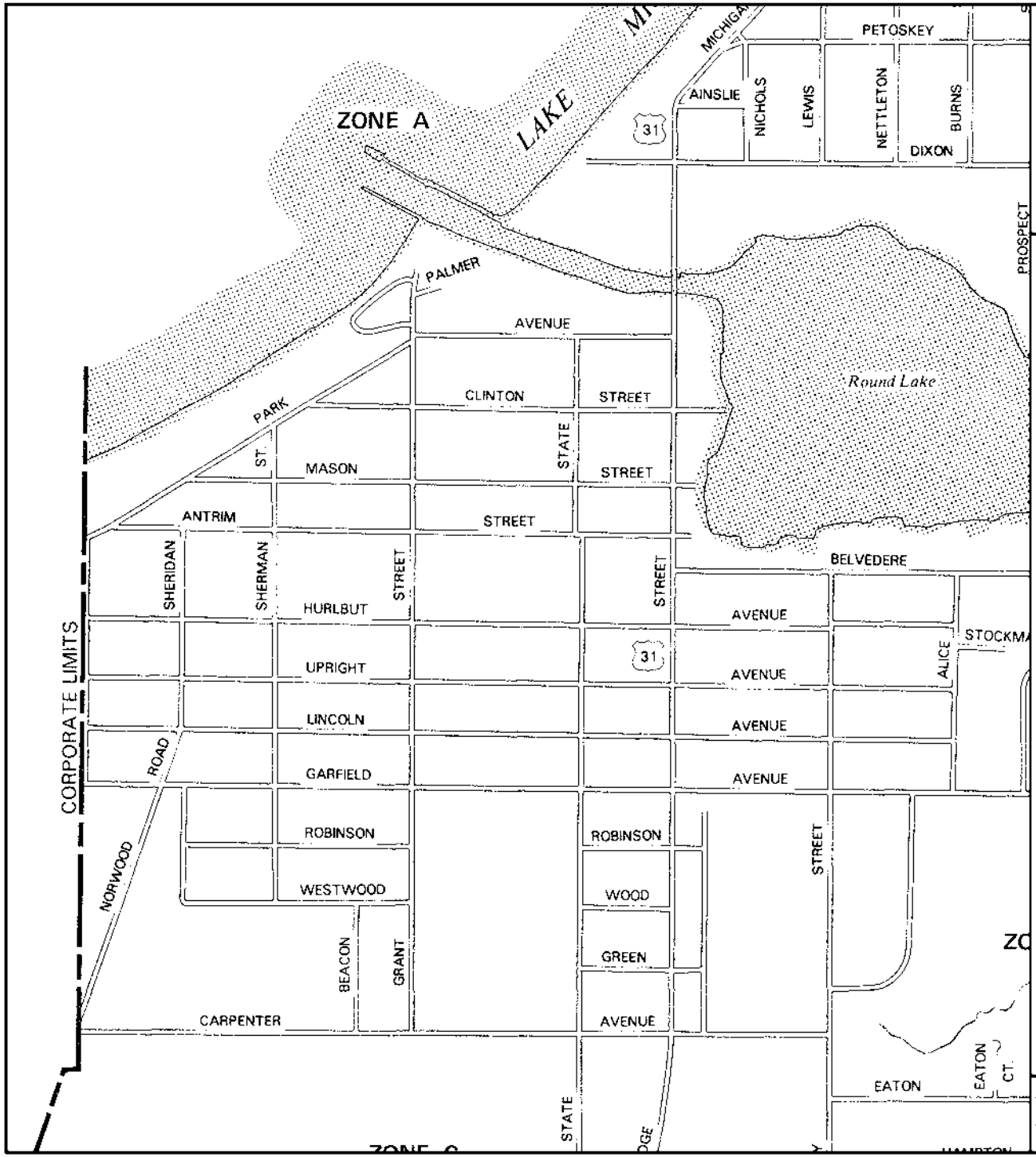
GREAT LAKES INFORMATION SYSTEM
MICHIGAN DEPARTMENT OF NATURAL RESOURCES
LAND AND WATER MANAGEMENT DIVISION

2 - 17 - 89

0 2000 4000
FEET

Appendix K

Floodplain Map



APPROXIMATE SCALE

800 0 800 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

CITY OF
CHARLEVOIX, MICHIGAN
CHARLEVOIX COUNTY

ONLY PANEL PRINTED

COMMUNITY-PANEL NUMBER
260057 0005 B

EFFECTIVE DATE:
FEBRUARY 11, 1983

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Appendix L

Lake Charlevoix Watershed Map

Lake Charlevoix Watershed Priority Area

Appendix M

Recreation Plan Map

Figure 4.1 Air Photo with Park Locations. (Excludes the Charlevoix Golf Club and tennis courts)

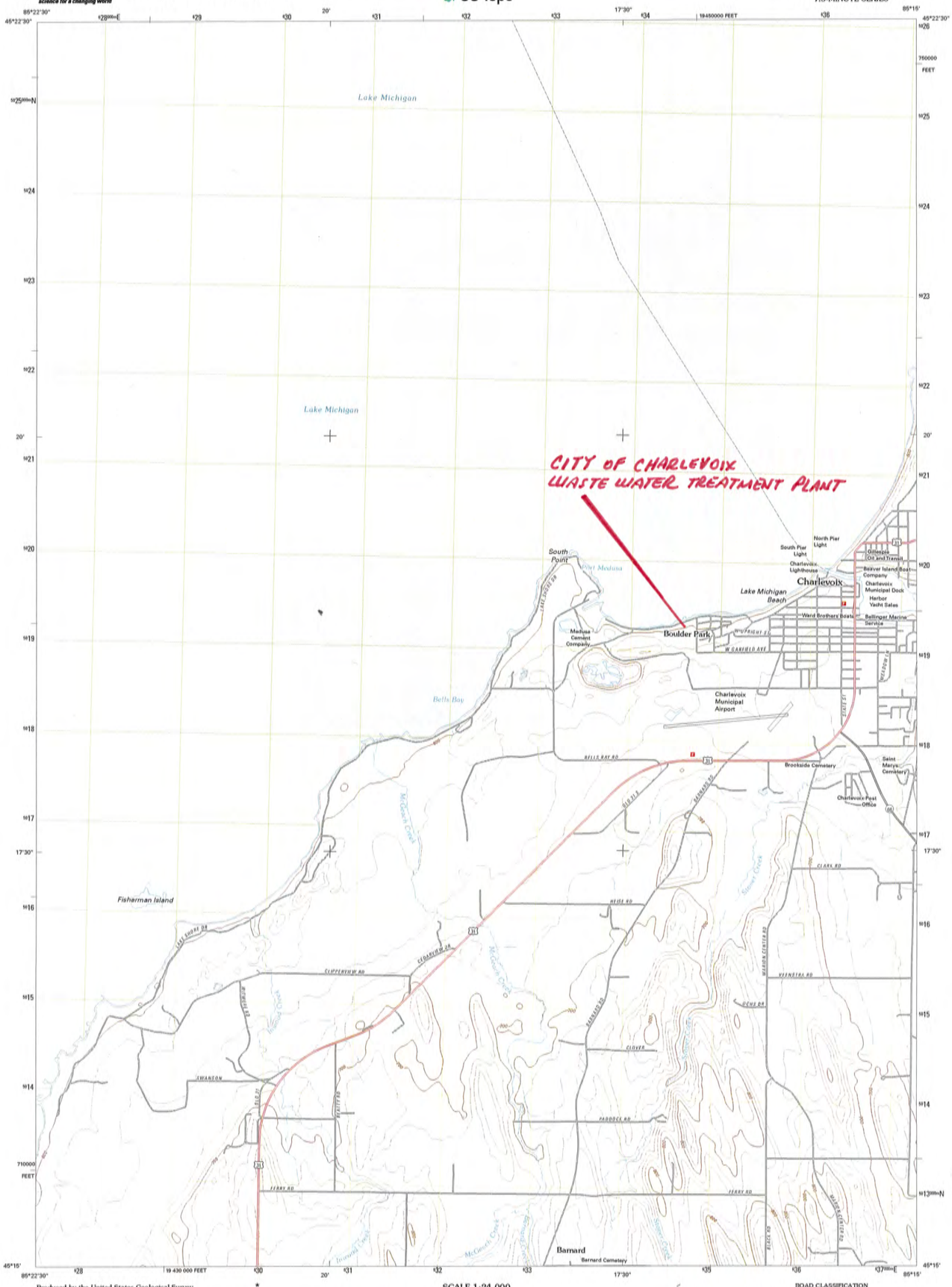
Appendix N

USGS Topographic Map

U.S. DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY

The National Map
US Topo

CHARLEVOIX QUADRANGLE
MICHIGAN-CHARLEVOIX CO.
7.5-MINUTE SERIES



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and 1 000-meter grid: Universal Transverse Mercator, Zone 16T
10 000-foot ticks: Michigan Coordinate System of 1983 (central zone)

Imagery.....NAIP, July 2009 - September 2009
Roads.....©2006-2010 Tele Atlas
Names.....GNIS, 2010
Hydrography.....National Hydrography Dataset, 2009
Contours.....National Elevation Dataset, 1999
Boundaries.....Census, IBWC, IDC, USGS, 1972 - 2010

MN 6° W 117 MILS
GN 1° 17' 21 MILS

UTM GRID AND 2011 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
Skyline Square Er
FR
Grid Zone Designation
16T

SCALE 1:24 000

KILOMETERS
METERS
MILES
FEET

CONTOUR INTERVAL 20 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with version 0.5.10 of the USGS US Topo Product Standard.
A metadata file associated with this product is draft version 0.5.16

MICHIGAN
QUADRANGLE LOCATION

Charlevoix OE W	Charlevoix	Inverness
Atwood OE W	Atwood	Ellsworth

ADJOINING 7.5' QUADRANGLES

ROAD CLASSIFICATION

Interstate Route
US Route
Ramp
State Route
Local Road
4WD

Interstate Route
US Route
State Route

CHARLEVOIX, MI
2011

Appendix O

Soil Maps

Soil Map—Charlevoix County, Michigan
(City of Charlevoix WWTP)

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Units

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Gully

Short Steep Slope

Other

Political Features

Cities

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

MAP INFORMATION

Map Scale: 1:1,620 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:15,840.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 16N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Charlevoix County, Michigan
Survey Area Data: Version 8, Nov 30, 2011

Date(s) aerial images were photographed: 6/20/2005; 4/27/1998

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Charlevoix County, Michigan (MI029)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
AgB	Alpena gravelly sandy loam, 0 to 6 percent slopes	6.0	60.2%
DDC	Deer Park-Dune land association, rolling	0.5	4.9%
EdB	Eastport sand, 0 to 6 percent slopes	2.2	22.7%
Ep	Epoufette sandy loam	0.0	0.0%
GlB	Gladwin loamy sand, 0 to 6 percent slopes	1.2	12.3%
Totals for Area of Interest		**9.9**	**100.0%**

Charlevoix County, Michigan

AgB—Alpena gravelly sandy loam, 0 to 6 percent slopes

Map Unit Setting

Elevation: 600 to 700 feet
Mean annual precipitation: 28 to 31 inches
Mean annual air temperature: 43 to 45 degrees F
Frost-free period: 130 to 150 days

Map Unit Composition

Alpena and similar soils: 100 percent

Description of Alpena

Setting

Landform: Lake terraces, lake plains, beach ridges
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: 4 to 10 inches of sandy and loamy material over calcareous sandy and gravelly glaciofluvial deposits

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water capacity: Very low (about 2.5 inches)

Interpretive groups

Land capability (nonirrigated): 6s

Typical profile

0 to 10 inches: Gravelly sandy loam
10 to 60 inches: Very gravelly sand

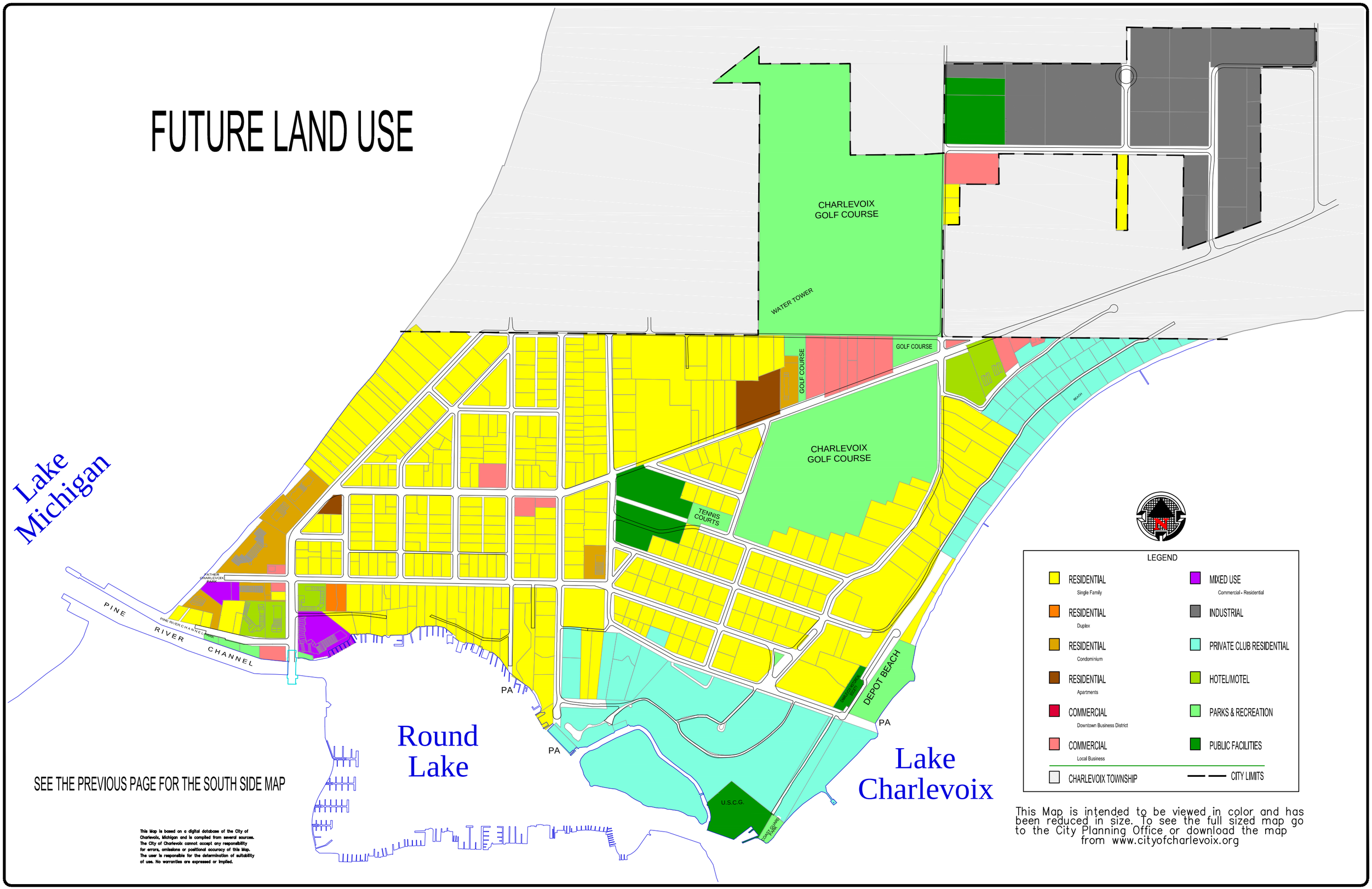
Data Source Information

Soil Survey Area: Charlevoix County, Michigan
Survey Area Data: Version 8, Nov 30, 2011

Appendix P

Future Land Use Maps

FUTURE LAND USE

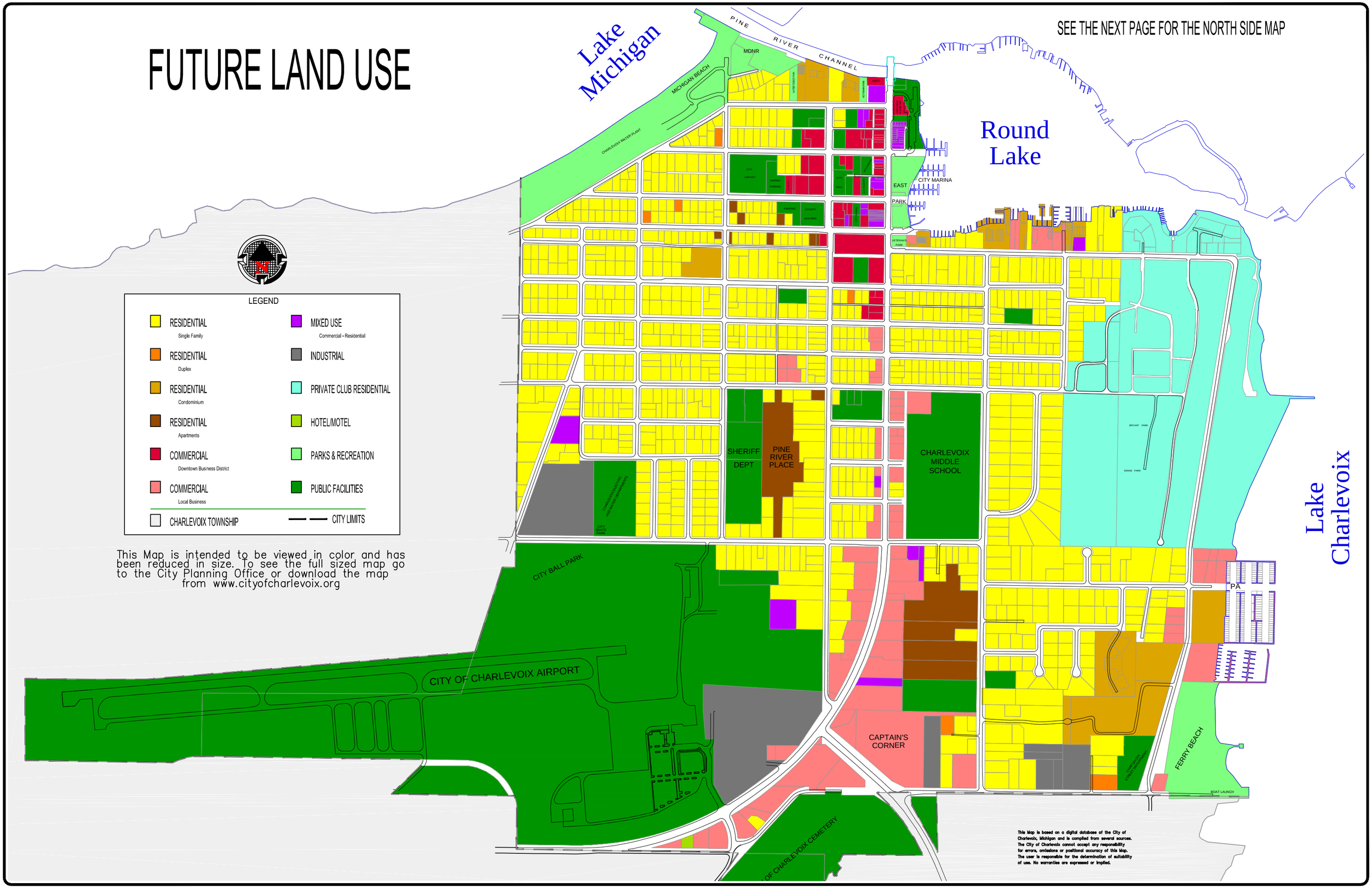


SEE THE PREVIOUS PAGE FOR THE SOUTH SIDE MAP

This Map is intended to be viewed in color and has been reduced in size. To see the full sized map go to the City Planning Office or download the map from www.cityofcharlevoix.org

This Map is based on a digital database of the City of Charlevoix, Michigan and is compiled from several sources. The City of Charlevoix cannot accept any responsibility for errors, omissions or positional accuracy of this Map. The user is responsible for the determination of suitability of use. No warranties are expressed or implied.

FUTURE LAND USE



Appendix Q

Fauna & Flora

Cass	Indiana bat (*Myotis sodalis*)	Endangered	Summer habitat includes small to medium river and stream corridors with well developed riparian woods; woodlots within 1 to 3 miles of small to medium rivers and streams; and upland forests. Caves and mines as hibernacula.
	Copperbelly water snake *(Nerodia erythrogaster neglecta)*	Threatened	Wooded and permanently wet areas such as oxbows, sloughs, brushy ditches and floodplain woods
	Eastern massasauga (*Sistrurus catenatus*)	Candidate	
	Mitchell's satyr butterfly (*Neonympha mitchellii mitchellii*)	Endangered	Fens; wetlands characterized by calcareous soils which are fed by carbonate-rich water from seeps and springs
Charlevoix	Piping plover (*Charadrius melodus*)	Endangered	Beaches along shorelines of the Great Lakes
	Piping plover (*Charadrius melodus*)	Critical Habitat Designated	
	Dwarf lake iris (*Iris lacustris*)	Threatened	Partially shaded sandy-gravelly soils on lakeshores
	Houghton's goldenrod (*Solidago houghtonii*)	Threatened	Sandy flats along Great Lakes shores
	Michigan monkey-flower (*Mimulus michiganensis*)	Endangered	Soils saturated with cold flowing spring water; found along seepages, streams and lakeshores
	Pitcher's thistle (*Cirsium pitcheri*)	Threatened	Stabilized dunes and blowout areas
Cheboygan	Piping plover (*Charadrius melodus*)	Endangered	Beaches along shorelines of the Great Lakes
	Piping plover (*Charadrius melodus*)	Critical Habitat Designated	
	Eastern massasauga (*Sistrurus catenatus*)	Candidate	
	Dwarf lake iris (*Iris lacustris*)	Threatened	Partially shaded sandy-gravelly soils on lakeshores
	Eastern prairie fringed orchid *(Plantathera leucophaea)*	Threatened	Mesic to wet prairies and meadows
	Houghton's goldenrod (*Solidago houghtonii*)	Threatened	Sandy flats along Great Lakes shores
	Michigan monkey-flower (*Mimulus michiganensis*)	Endangered	Soils saturated with cold flowing spring water; found along seepages, streams and lakeshores
	Pitcher's thistle (*Cirsium pitcheri*)	Threatened	Stabilized dunes and blowout areas

MNFI Home Contact Us Plant List Animal List Abstracts Help

Michigan Natural Features Inventory

Web Database Search

MICHIGAN STATE UNIVERSITY EXTENSION

Search Results for Town 34N, Range 08W, Section 28
Displaying Record 1 to 3 of 3 Records Found

Query Results Generated on Nov 21, 2012
Database Updated on Mar 15, 2012

New Search | Refine Search | Previous 25 Records | Next 25 Records

Abstract	Common Name	Scientific Name	State Status	Federal Status	Last Observed Date	Element Category	Mapping Precision	Site of Observation	Best Documentation of EO	Town Range		Section	County
	Eastern flat-whorl	Planogyra asteriscus	SC		1929-PRE	Animal	M		Walker. No date. #127746 UMMZ	34N	08W	23,24,25,26,27,28,33,34,35	Charlevoix
	English sundew	Drosera anglica	SC		1894-08-26	Plant	GX	Charlevoix		34N	08W	12,13,14,23,24,25,26,27,28,33,34,35	Charlevoix
	Spike-lip crater	Appalachina sayanus	SC			Animal	GX	Charlevoix County	Walker. No date. #102274 UMMZ	34N	08W	14,23,24,25,26,27,28,29,31,32,33,34,35	Charlevoix

New Search | Refine Search | Previous 25 Records | Next 25 Records

Appendix R

WWTP Electrical and Mechanical Evaluation

CENTURY A&E
Facilities Design

277 Crahen Avenue NE
Grand Rapids, Michigan 49525-3459
Telephone: (616) 456-5227
Facsimile: (616) 456-5228

Memo

Date: August 3, 2012

To: Mark Prein **cc:** Matt Tipping

From: Century A&E – Rich Ducham & Jamie Hagerman

Re: **City of Charlevoix, MI. Waste Water Treatment Plant Evaluation – Electrical/Mechanical**

ELECTRICAL

Electrical evaluation performed on 7/13/12 by Rich Ducham (Century A&E):

Main Building

The existing WWTP main electrical service is a 480V, 3 Wire, Delta configuration. The main electrical service is comprised of a medium voltage pad mount transformer, standby diesel generator with manual transfer switch and a 600 amp main breaker located in the Main Building electrical room motor control center.

1. The existing transfer switch associated with the standby generator is manually controlled. The branch circuit protection associated with the transfer switch, generator and standby power feeder is 200 amp. The manual transfer switch should be replaced with an automatic transfer switch. The branch circuit protection should be re-sized for the loads required during a utility power outage to minimize standby power system branch circuit protection trips experienced by the plant during power outages.
2. In main electrical room there are several National Electrical Code working clearance issues:
   a. Overall there is inadequate electrical working space between the existing motor control center and the walls on either side of the motor control center. 41” or working space was observed during the electrical evaluation. The National Electric Code requires 42” of clear working space in front of electrical equipment for this installation. This issue may have been issued a variance from the local Inspector since it affects the main power supply to the plant and would have been very costly to remedy during the original construction of the plant.
   b. There is inadequate electrical working clearance between the existing main motor control center, the existing rack mounted variable frequency drive enclosures attached to the back of the main motor control center and the existing manual transfer switch. Less than 36” or working space was observed during the electrical evaluation. The National Electric Code requires 42” of clear working space in front of electrical equipment for this installation.
   c. There is inadequate electrical working space between the existing motor control center and the existing water fountain. 41” or working space was observed during the electrical evaluation. The

277 Crahen Avenue NE
Grand Rapids, Michigan 49525-3459
Telephone: (616) 456-5227
Facsimile: (616) 456-5228

National Electric Code requires 42" of clear working space in front of electrical equipment for this installation. If the existing motor control center is to remain in its current location water fountain should be removed or relocated.

3. The existing main motor control center had a nameplate date of 1972. Although the existing motor control center has been well maintained, as the equipment continues to age replacement/repair components will become less available. Considering the current age of the motor control center and the working clearance issues noted above the motor control center should be replaced and possibly relocated.
4. The lighting in the Main Buildings main floor has recently been replaced with newer T8, 2x4 lay-in troffer light fixtures in the main corridor and lab areas and newer T8 1x4 surface mount vapor wraps in the chlorine room. Lighting levels appear adequate and light fixtures are in good condition, recommend current lighting stays as is except for the following:
   a. The light fixtures in the stairwell leading to the pipe gallery are type T12, 2-lamp wrap light fixtures and should be replaced.
   b. In the restroom the vanity light fixture lamp lens is missing needs to be replaced.
5. The lighting in the main building lower level piping gallery has recently been replaced with newer T8, 2-lamp, 1x4, chain hung, shop style light fixtures. Lighting levels appear adequate and light fixtures are in good condition, recommend current lighting stays as is. Would recommend vapor wrap type fixtures for any future upgrades in this area.
6. The existing plant main control panel controls are of the pneumatic type. Control panel level, flow, pressure indication is done via paper chart recorders and pneumatics along with some newer electronic digital indicators. Plant alarming and motor status indication is done via annunciator. I would recommend the existing control panel be replaced with a PLC based SCADA control and monitoring system for all plant control, monitoring, alarming and logging functions.

Digester Building

1. The existing main motor control center had a nameplate date of 1972. Although the existing motor control center has been well maintained, it is showing signs of rust deterioration around the bottom support frame and as the equipment continues to age replacement/repair components will become less available. During my evaluation it was brought to my attention by plant personnel that the Headworks Building main feeder breaker compartment bus stabs had welded to the vertical bus of the motor control center section it is installed in making the breaker compartment irremovable from the motor control center for servicing or maintenance purposed. Considering the current age of the motor control center, deteriorating condition and bus damage the motor control center should be replaced or at minimum the damaged bus section repaired/replaced and areas of rust deterioration be restored.
2. The lighting in the upper and lower levels has recently been replaced with newer T8, 2-lamp, 1x4, surface mounted, shop style light fixtures. Lighting levels appear adequate and light fixtures are in good condition, recommend current lighting stays as is. Recommend vapor wrap type light fixtures for any future lighting upgrades in this area.
3. Anaerobic Digester facilities carry an electrical hazardous location classification rating because of the bio-gas piping inside of the building. This building appears to have a single bio-gas tap point located in the lower level that penetrates approximately 2' into the building from the exterior below grade. The building rating should be reviewed in more detail.

Headworks Building

1. The building and electrical installation is approximately 10 years old. The motor control center and all electrical components located in the electrical room are in great condition. One issue in the electrical room is that a surface wall mounted junction box is installed in front of the motor control center wireway

277 Crahen Avenue NE
Grand Rapids, Michigan 49525-3459
Telephone: (616) 456-5227
Facsimile: (616) 456-5228

opening near the main breaker compartment making it almost impossible to open wireway for access to service the installed wiring. The junction box in question should be relocated to allow proper access the motor control center wireway.

2. Lighting levels in electrical room appear adequate and light fixture is in good condition, recommend current lighting stays as is.
3. In the process area the electrical installations is in good condition with the exception of the following.
    a. On the upper level over the open grated channel most legends and equipment identification plates on control stations and safety disconnect switches have deteriorated to the point of being illegible for someone new to the plant not knowing what the control stations and safety disconnect switches are connected to.
    b. On the upper level the flexible connection on the lower screen motor is not hazardous location rated. Change flexible connection to a Cl.I, Div.1, explosion proof flexible conduit coupling.
    c. At grade level replace existing frayed explosion proof flexible conduit coupling with new at motor on lower end of grit classifier.

Storage Building

1. Newer building no changes required.

Chemical Storage Building

1. Newer building with no electrical, no changes required.

Standby Generator & Fuel Tank

1. Replace existing fuel tank. The following areas related to the fuel tank do not meet current MDEQ requirements for fuel tanks:
    a. Fuel tank is not double lined.
    b. Fuel tank does not have interstitial space leak sensing.
    c. Fuel tank does have proper venting and emergency venting.
    d. Fuel tank does not have proper fill port containment or fill alarm.
2. Existing generator and enclosure is well past its useful life expectancy and are in overall poor condition. As the generator and its components continue to age replacement/repair of those components will become less available or cost effective maintain. Replacing the existing generator would be of high importance to provide the plant with a dependable standby power source during a prolonged utility power outage.

Primary Clarifiers

1. East Primary Clarifier:
    a. Area inside of clarifier walls is a Cl. 1, Div. 2 hazardous location. Conduit seals were not provided in conduits from below grade to the clarifier mechanism motor, lights or control station. This is an outdoor installation, the conduits, conduit supports, conduit clamps, control station and junction boxes are rust deteriorated and in poor condition. At one point in the horizontal conduit installation along the clarifier mechanism bridge the conduits have completely rusted through with conductors exposed to damage. All associated electrical should be replaced.
2. West Primary Clarifier:
    a. Area inside of clarifier walls is a Cl. 1, Div. 2 hazardous location. Conduit seals were not provided in conduits from below grade to the clarifier mechanism motor, lights or control station.

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This is an outdoor installation, the conduits, conduit supports, conduit clamps, control station and junction boxes are rust deteriorated and in poor condition. All associated electrical should be replaced.

Final Clarifiers

1. North Final Clarifier:
   a. This is an outdoor installation, the conduits, conduit supports, conduit clamps, control station and junction boxes are rust deteriorated and in poor condition. All associated electrical should be replaced.
2. South Final Clarifier:
   a. This is an outdoor installation, the conduits, conduit supports, conduit clamps, control station and junction boxes are rust deteriorated and in poor condition. All associated electrical should be replaced.

MECHANICAL

Mechanical evaluation performed on 7/13/12 by Jamie Hagerman (Century A&E):

Main Building

1. Garage:
   a. Unit heater Dunham Bush hydronic type: Currently works but is old and corroded. Recommend replace in kind.
   b. Floor Sink: Functioning well, no work.
2. Conference Room/Break Room
   a. Newer Mini Split AC Unit with baseboard hot water fin tube heating. Functioning well.
   b. Kitchen sink. Functioning well.
3. Lab/Electrical Room/Corridor/Office/Restroom
   a. Existing split DX AHU is fairly new but does not maintain desired temperatures for the spaces being served. The units only T-stat is located in the lab. The unit cannot keep up with the lab loads. Each room is different and recommend that each room have its own controls.
   b. Possible solutions:
      i. Use the existing unit to handle the lab only and install a dedicated mini split to handle the office. The electrical gear space could be just heat relief.
      ii. Install a new larger system with VAV boxes with reheat for each space.
   c. The drinking fountain is located too close to the electrical gear and needs to be relocated
   d. No changes for the restroom plumbing or HVAC are recommended at this time.
4. Area on the level below and in the storage place next to the Conference /Breakroom
   a. There is an exhaust fan on the roof that pulls from both spaces. Condition of fan unknown. Not sure what the purpose to exhaust is or if there is a source for the makeup air. Need to evaluate more.
5. Lower level pipe gallery
   a. The existing domestic water heater and distribution is in good condition.
   b. The south end of the existing below slab sanitary has been abandoned in place, a pipe snake was used to clean out the pipe and broke off in the pipe and could not be removed.. The floor needs to

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be sawcut and piping and floor drains replaced. The existing above ground sanitary that is cast iron is gradually being replaced with PVC when leaks occur.

c. The level is ventilated all the time in the summer and 2 – 3 hours per day in the winter. Depending on the future designation of the space, Ten States Standards may require continuous ventilation. There are two intake louvers at the north end in window type wells with insect screens and hot water coils and an inline exterior exhaust fan at the south end. The client thinks the hot water coils work, but need to verify both function and capacity. Intake louver insect screens need to be cleaned.

d. The exhaust fan works and does not appear to be corroded.

e. At one time, there was fin tube all thru the lower level but has since been removed without causing any issues with heating.

6. Chlorine Gas Room

a. The ventilation system operates when the room is occupied. There are two intake louvers with insect screens and hot water coils. The exhaust is ducted low with an explosion proof exhaust fan on the roof. One of the intake louvers has been sealed off because the hot water coil was leaking. The coil needs to be replaced. The room is also heated via a hot water cabinet heater.

7. Chemical Feed Room (next to office and Chlorine Gas Room)

a. The intake louver with a hot water coil has been sealed off. There is no ventilation air intake. A hydronic unit heater serves the space and is in decent condition. A new exhaust fan and intake louver need to be installed.

<u>Digester Building</u>

1. Upper & Lower Levels:

a. Hydronic Unit heaters serving the upper and lower levels Trane S-CU 38S are functional but old. Recommend replacing in kind

b. Hot water boilers are new Lochinvar Knights and are of sufficient capacity for the current conditions. The hot water pumps are working but look pretty old and could be replaced. Piping should be reinsulated. The hot water boilers serve both the main building and the digester building heating hot water systems. If the digesters are no longer used, the boilers should be relocated to the Main Building. Currently the hot water is piped underground to the main building and the operators feel they lose a lot of heat along the way.

c. The exhaust fan serving the gas room digester room works but the curb leaks and the unit is old. Repair roof and replace fan in kind.

d. The exhaust fan serving the upper and lower levels is functional but old. Recommend replace in kind.

<u>Screen Building</u>

1. Screening area:

a. Three 25 KW unit heaters explosion proof are functional but old and corroded. Recommend to replace in kind

b. Two wall type exhaust fans with XP motors are functional but old and corroded. Recommend to replace in kind

c. The wall mounted thermostats and exhaust fan switches need replacing.

d. Four wall louvers appear in good condition, however the damper and actuator are corroded should be replaced.

2. Sample Room:

a. Unit heater, intake louver and exhaust fan in good condition.

CENTURY A&E
Facilities Design

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3. Electrical Room:
    a. Unit heater, intake louver and exhaust fan in good condition.

Storage Building

1. Newer building no changes required.

Chemical Storage Building

1. Newer open building with no doors. The exterior safety shower is not always active. In the winter, the piping is drained so it doesn't freeze. However, it needs a better self draining valve since there was still water in the system and the shower valve cracked. If the chlorine tanks need to be filled in the winter, the water to the safety shower is turned on during the filling and then turned off after the truck leaves.

Appendix S

Present Worth Analysis

CITY OF CHARLEVOIX SRF PROJECT PLAN

PRESENT WORTH ANALYSIS

Project Description	*Alternate 1* Optimize Existing Facility [A]	*Alternate 2* Conventional Activated Sludge Upgrades [B]	*Alternate 3* Advanced Treatment
Capital Costs (including ELAC)			
Structures	$5,325,125	$7,250,000	$6,062,000
Equipment	$2,078,375	$2,395,000	$4,833,000
Total Project Cost	$7,403,500	$9,645,000	$10,895,000
(A) 20-yr Present Worth of Capital Costs [1]	$3,298,654	$4,297,362	$4,854,304
Operation, Maintenance & Replacement (OM&R)			
Additional Energy Costs	$0	$0	$0
Energy Cost Savings	$0	$0	$0
Equipment Replacement / Chemicals	$0	$0	$65,000
Additional Labor	$0	$0	$0
Annual OM&R [2]	$0	$0	$65,000
Annual Energy Cost	$0	$0	$0
(B) 20-yr Present worth of OM&R [1]	$0	$0	$873,674
(C) 20-yr Present worth of Energy Cost [3]	$0	$0	$0
Salvage Value of Capital			
Salvage value at 20 years	$3,195,075	$4,350,000	$3,637,200
(D) 20-yr Present worth of Salvage [1]	$1,423,576	$1,938,157	$1,620,567
Total Present Worth (A + B + C - D)	$1,875,078	$2,359,205	$4,107,411
Equivalent Annual Cost (based on Total Present Worth)	$139,503	$175,521	$305,585

Total Existing Meter Equivalents (REUs)
WWTP Service Area REUs: 2,865

Unit of Government Responsible for Payment for:	Alternate 1	Alternate 2	Alternate 3
City and Townships (Service Area)	100.00%	100.00%	100.00%
Service Area Annual Cost per REU	$48.69	$61.26	$106.66
Service Area Monthly Cost per REU:	$4.06	$5.11	$8.89

Total Proposed Project Cost:	**$10,895,000**
Total Present Worth:	**$4,107,411**
Total Equivalent Annual Cost [4]:	**$305,585**

	Annual [4]	**Monthly [4]**
Total Service Area Cost per REU:	$106.66	$8.89

Notes:

[1] U.S. EPA Discount rate for Year 2013 is 4.125%

[2] Negative value indicates reduction in Annual O&M

[3] Assumed energy cost rate of escalation is 3.75%

[4] Based on Total Present Worth

[A] Optimizing the existing facility consists of Basic Plant Improvements.

[B] May not be able to meet NPDES permit during cold weather.

Appendix T

Annual Cost

2110372
April 25, 2013

CITY OF CHARLEVOIX
CHARLEVOIX COUNTY, MICHIGAN
WASTEWATER TREATMENT PLANT IMPROVEMENTS
ANNUAL COST

No.	Project	Project Cost Estimate	Annual Debt Service [1]	Operation, Maintenance & Replacement Increase/Decrease [2]	Total Annual Cost
1.	WWTP Improvements	$10,895,000	$698,882.97	$65,000.00	$763,882.97
	Total	$10,895,000	$698,882.97	$65,000.00	$763,882.97

Estimated Number of Existing Meter Equivalents (REU):	2,865
Annual REU Cost:	$266.63
Monthly REU Cost:	$22.22

Notes:

[1] Annual debt service based on 20-year loan with a 2.50% interest rate.

[2] Operation, Maintenance & Replacement cost based on equipment replacement and chemical costs over the 20-year planning period.

Appendix U

Public Hearing Transcript - RESERVED

Appendix V

Public Hearing Sign-In Sheet - RESERVED

Appendix W

Public Hearing Notice/Affidavit - RESERVED

Appendix X

Resolutions

City of Charlevoix
County of Charlevoix

Resolution No. 2013-01-02

Resolution Authorizing the S2 Grant Agreement

Minutes of the regular meeting of the City Council of the _____ of City of Charlevoix County of Charlevoix, State of Michigan, (the "Municipality") held on January 21, 2013.

PRESENT: Members: Councilmembers Kusina, Picha, Stevens, Vollmer, Cole, Gennett

ABSENT: Members: None

Member Bryan Vollmer offered and moved the adoption of the following resolution, seconded by Member Jill Picha.

WHEREAS, Part 52 (strategic water quality initiatives) of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended ("Part 52"), provides at MCL 324.5204a that the Michigan Finance Authority (the "MFA") in consultation with the Michigan Department of Environmental Quality (the "DEQ") shall establish a strategic water quality initiatives grant program; and

WHEREAS, in accordance with the provisions of 2010 PA 231, which provides grants to assist municipalities in completing loan application requirements under MCL 324.5308 or completing loan application requirements for other sources of financing for sewage treatment works projects, storm water treatment projects or nonpoint source projects; and

WHEREAS, in accordance with the provisions of 1985 PA 227, as amended, Part 52, and other applicable provisions of law, the MFA, the DEQ, and the Municipality that is a grant recipient shall enter into a grant agreement (the "S2 Grant Agreement") that requires the Municipality to repay the grant under certain conditions as set forth in MCL 324.5204a, as amended; and

WHEREAS, the Municipality does hereby determine it necessary to undertake planning, revenue system development, and/or design activities related to a project for which it intends to seek financing for construction; and

WHEREAS, it is the determination of the Municipality that at this time, a grant in the aggregate principal amount not to exceed $120,000.00 ("Grant") be requested from the MFA and the DEQ to pay for the planning and/or design activities; and

WHEREAS, the Municipality shall obtain this Grant by entering into the S2 Grant Agreement with the MFA and the DEQ.

NOW, THEREFORE, BE IT RESOLVED THAT:

1. The City Manager (*title of the desginee's position*), a position currently held by Robert J. Straebel (*name of the designee*), is designated as the Authorized Representative for purposes of the S2 Grant Agreement.

2. The proposed form of the S2 Grant Agreement between the Municipality, the MFA and DEQ (attached hereto as Appendix I) is hereby approved and the Authorized Representative is authorized and directed to execute the S2 Grant Agreement with such revisions as are permitted by law and agreed to by the Authorized Representative.

3. The Municipality shall repay the Grant, within 90 days of being informed to do so, with interest at a rate not to exceed 8 percent per year, to the Authority if any of the following conditions occur:

(a) the Municipality fails to submit an administratively complete loan application for assistance from the SRF, the SWQIF or other source of financing for the project within 3 years of the Grant award;

(b) the project has been identified as being in the fundable range or is approved for funding from another source and the Municipality declines loan assistance for 2 consecutive fiscal years unless the Municipality proceeds with funding from another source; or

c) the Municipality is unable to, or decides not to, proceed with constructing the project.

4. The Grant, if repayable, shall be a first budget obligation from the general funds of the Municipality, and the Municipality is required, if necessary, to levy ad valorem taxes on all taxable property in the Municipality for the payment thereof, subject to applicable constitutional, statutory and Municipality tax rate limitations.

5. The Municipality shall not invest, reinvest or accumulate any moneys deemed to be Grant funds, nor shall it use Grant funds for the general local government administration activities or activities performed by municipal employees.

6. The Authorized Representative is hereby jointly or severally authorized to take any actions necessary to comply with the requirements of the MFA and the DEQ in connection with the issuance of the Grant. The Authorized Representative is hereby jointly or severally authorized to execute and deliver such other contracts, certificates, documents, instruments, applications and other papers as may be required by the MFA or the DEQ or as may be otherwise necessary to effect the approval and delivery of the Grant.

7. The Municipality acknowledges that the S2 Grant Agreement is a contract between the Municipality, the MFA and the DEQ.

8. All resolutions and parts of resolutions insofar as they conflict with the provisions of this Resolution are rescinded.

YEAS: 6 Members: Kusina, Picha, Stevens, Vollmer, Cole, Gennett

NAYS: 0 Members: None

RESOLUTION DECLARED ADOPTED

I hereby certify that the foregoing is a true and complete copy of a resolution adopted by the City Council of the City of Charlevoix, County of Charlevoix, said meeting was conducted and public notice of said meeting was given pursuant to and in full compliance with the Open Meetings Act, being Act 267, Public Acts of Michigan, 1976, and that the minutes of said meeting were kept and will be or have been made available as required by said Act.

Carol A. Ochs

Name

Carol A. Ochs of _____, Clerk

City of Charlevoix County of Charlevoix