Permit Fact Sheet

1 General Information

Permit Number:	WI-0060763-08-0	
Permittee Name:	VILLAGE OF LONE ROCK	
Address:	P O Box 78 458 South Tamarack Street	
City/State/Zip:	Lone Rock WI 53556	
Discharge Location:	SW ¼ of NW ¼ of Section 12, T8N-R2E, Buena Vista Township	
Receiving Water:	Groundwaters of the Lower Wisconsin River Basin (Bear Creek, LW14) in Richland County	
StreamFlow ($Q_{7,10}$):	NA	
Stream Classification:	NA	
Design Flow(s)	Annual Average	0.057 MGD
Significant Industrial Loading?	None	
Operator at Proper Grade?	Yes – Class 1 Facility with Subclass D–Ponds/Aerated Lagoons. Two operators fully certified.	

2 Facility Description

The Village of Lone Rock owns and operates the Lone Rock Wastewater Treatment Facility with an annual average design flow of 0.057 million gallons per day (MGD). The facility serves a population of approximately 1,000 and currently receives approximately 0.050 MGD of domestic wastewater for treatment. Treatment consists of two aerated lagoons operated in series followed by an effluent holding pond, with treated effluent discharged to either of two effluent seepage areas covering an area of about two acres. Four groundwater monitoring wells around the site are monitored quarterly. Due to the proximity of sloughs of the Wisconsin River in the direction of groundwater flow from the facility, the effluent discharge is considered an indirect surface water discharge. The permittee has been found to be in substantial compliance with the terms of its current permit.

The attached Groundwater Evaluation and Exceedence Report by Alan Hopfensperger for this permit reissuance dated October 22, 2014 contains additional information regarding this discharge to the groundwaters of the Lower Wisconsin River Basin.

3 Proposed Permit Reissuance

The Department anticipates an effective date of January 1, 2015 for the proposed permit. Therefore, to allow a full permit term of five years, the proposed permit's expiration date is December 31, 2019. If the permit reissuance process takes more or less time than anticipated, the permit's dates of effectiveness and expiration may be changed accordingly.

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, WasteType/sample Contents and Treatment Description (as applicable)**
701	0.050 MGD (10/01/2013 – 09/30/2014)	Representative influent samples shall be collected at the influent wet well.
001	0.051 MGD (10/01/2013 – 09/30/2014)	Representative effluent samples shall be collected at the wet well prior to discharge to the seepage cells
002	Ponds and Lagoons—sludge not removed	Representative composite sludge samples shall be collected from ponds #1 and #2 in 2016 and monitored for List 1 and PCBs.

Sample Point Designation For Groundwater Monitoring Systems			
System	**Sample Pt Number**	**Well Name**	**Comments**
seepage cell monitoring system	801	MW-1 (801) BACKGROUND WELL	
	802	MW-2 (802) DOWNGRADIENT WELL	
	803	MW-1A (803) DOWNGRADIENT WELL	
	804	MW-2A (804) DOWNGRADIENT WELL	

3 Influent - Proposed Monitoring

3.1 Sample Point Number: 701- INFLUENT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Continuous	Continuous	
BOD5, Total		mg/L	2/Month	24-Hr Comp	
Suspended Solids, Total		mg/L	2/Month	24-Hr Comp	
Nitrogen, Total Kjeldahl		mg/L	Monthly	24-Hr Comp	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nitrogen, Organic Total		mg/L	Monthly	Calculated	
Nitrogen, Ammonia (NH3-N) Total		mg/L	Monthly	24-Hr Comp	

3.1.1 Changes from Previous Permit:

Influent sample type for BOD_5, TSS, TKN and Ammonia were changed from "Grab" to "24-Hr Comp".

3.1.2 Explanation of Limits and Monitoring Requirements

Standard influent monitoring requirements for a minor municipal land treatment system.

4 Land Treatment – Proposed Monitoring and Limitations

4.1 Sample Point Number: 001- EFFLUENT @ WET WELL

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Continuous	Continuous	See footnote 2.2.1.2 in the permit.
BOD5, Total	Monthly Avg	50 mg/L	2/Month	Grab	
Suspended Solids, Total		mg/L	2/Month	Grab	
pH Field		su	Weekly	Grab	
Nitrogen, Organic Total		mg/L	Monthly	Calculated	
Nitrogen, Ammonia (NH3-N) Total		mg/L	Monthly	Grab	
Nitrogen, Total Kjeldahl		mg/L	Monthly	Grab	
Nitrogen, Nitrite + Nitrate Total		mg/L	Monthly	Grab	
Nitrogen, Total		mg/L	Monthly	Calculated	
Solids, Total Dissolved		mg/L	Monthly	Grab	
Chloride		mg/L	Monthly	Grab	

4.1.1 Changes from Previous Permit:

None.

4.1.2 Explanation of Limits and Monitoring Requirements

Standard effluent monitoring requirements for a minor municipal land treatments system. Requirements for land treatment of municipal wastewater are determined in accordance with ch. NR 206, Wis. Adm. Code.

5 Groundwater – Proposed Monitoring and Limitations

5.1 Groundwater Monitoring System for seepage cell monitoring system

Location of Monitoring system: SW ¼ of NW ¼ of Section 12, T8N-R2E, Buena Vista Township

Wells to be Monitored: MW-1 (801) BACKGROUND WELL, MW-2 (802) DOWNGRADIENT WELL, MW-1A (803) DOWNGRADIENT WELL, MW-2A (804) DOWNGRADIENT WELL

Well Used To Calculate PALs: 801

Enforcement Standard Wells: None

Parameter	Units	Preventative Action Limit	Enforcement Standard	Frequency
Depth To Groundwater	feet	*****	N/A	Quarterly
Groundwater Elevation	feet	*****	N/A	Quarterly
Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	5.1	N/A	Quarterly
Chloride Dissolved	mg/L	125	N/A	Quarterly
pH Field	su	8.5	N/A	Quarterly
Nitrogen, Ammonia Dissolved	mg/L	0.97	N/A	Quarterly
Nitrogen, Organic Dissolved	mg/L	8.0	N/A	Quarterly
Solids, Total Dissolved	mg/L	280	N/A	Quarterly

5.1.1 Changes from Previous Permit:

Alternative Concentration Limit (ACL) for Nitrite + Nitrate was 6.1 mg/L during the previous permit term; recalculated ACL will be 5.1 mg/L for the reissued permit. Preventive Action Limits (PALs) recalculated for: pH (was a range from 5.9 s.u.to 7.9 s.u. and now a range of 6.5 s.u. to 8.5 s.u); and Organic Nitrogen (was 2.7 mg/L and now 8.0 mg/L). In January 2011 Ammonia Nitrogen became a health related parameter with a PAL of 0.97 mg/L that is included in the reissued permit in place of the calculated PAL of 2.1 mg/L that was in effect during the previous permit term.

5.1.2 Explanation of Limits and Monitoring Requirements

Groundwater limits and requirements are determined in accordance with ch. NR 140, Wis. Adm. Code. Enforcement Standards do not apply at this site because the groundwater discharge plume flows into surface water before reaching the discharge site point of standards application. See section 3.1.1.4 in the permit for further discussion. Indicator parameter Preventive Action Limit (PAL) values are established per s. NR 140.20, Wis. Adm. Code. Alternative Concentration Limits as allowed under s. NR 140.28, Wis. Adm. Code, are established on a case by case basis.

6 Land Application - Proposed Monitoring and Limitations

Municipal Sludge Description						
Sample Point	**Sludge Class (A or B)**	**Sludge Type (Liquid or Cake)**	**Pathogen Reduction Method**	**Vector Attraction Method**	**Reuse Option**	**Amount Reused/Disposed (Dry Tons/Year)**
002	B	Liquid	Fecal Coliform	Injection or Incorporation	Land Application	0
Does sludge management demonstrate compliance? Yes						
Is additional sludge storage required? No						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? No If yes, special monitoring and recycling conditions will be included in the permit to track any potential problems in landapplying sludge from this facility						
Is a priority pollutant scan required? NA Priority pollutant scans are required once every 10 years at facilities with design flows between 5 MGD and 40 MGD, and once every 5 years if design flow is greater than 40 MGD.						

6.1 Sample Point Number: 002- LAGOON SLUDGE

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Once	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Once	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Once	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Once	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Once	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Once	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Once	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Once	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Once	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Once	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Once	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Once	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Once	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Once	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Once	Composite	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Selenium Dry Wt	High Quality	100 mg/kg	Once	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Once	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Once	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	

6.1.1 Changes from Previous Permit:

Sludge monitoring parameters and frequency remain the same with new time frame for monitoring (calendar year 2016).

6.1.2 Explanation of Limits and Monitoring Requirements

Requirements for land application of municipal sludge are determined in accordance with ch. NR 204 Wis. Adm. Code. Ceiling and high quality limits for metals in sludge are specified in s. NR 204.07(5). Requirements for pathogens are specified in s. NR 204.07(6) and in s. NR 204.07 (7) for vector attraction requirements. Limitations for PCBs are addressed in s. NR 204.07(3)(k).

7 Compliance Schedules

None.

8 Attachments:

Substantial Compliance Determination – October 28, 2014

NR 140 Groundwater Evaluation Report – October 22, 2014

Public Notice –

9 Proposed Expiration Date:

December 31, 2019

Prepared By:

Phillip Spranger, Wastewater Specialist

Date: October 29, 2014

cc: David Carper, Compliance Engineer

Substantial Compliance Determination

Permittee Name: VILLAGE OF LONE ROCK		Permit Number: 0060763-08-0
	Compliance?	Comments
Discharge Limits	Yes	
Sampling/testing requirements	Yes	
Groundwater standards	Yes	PAL and ACL exceedences for Nitrogen ammonia and TDS in MW-2
Reporting requirements	Yes	
Compliance schedules	NA	
Management plan	NA	
Other:	Yes	
Enforcement Considerations	none	
In substantial compliance?	Yes Comments: Compliance inspection conducted October 20, 2014. Signature: Dave Carper Date: 10/28/2014 Concurrence: Date:	

CORRESPONDENCE/MEMORANDUM

DATE: October 22, 2014 FILE REF: FIN 7191

TO: File

FROM: Alan Hopfensperger

SUBJECT: Groundwater Evaluation and Exceedence Report for the Lone Rock WWTF, WPDES Permit # 0060763-08-0

The Village of Lone Rock WWTP consists of a primary lagoon, a secondary lagoon, a holding pond and two seepage cells.

Groundwater is sampled on a quarterly basis from a four well monitoring system consisting of one up gradient (Background) well and three down gradient wells.

Facility Groundwater Monitoring System(s)

Well Locations		
Well Name	**Well Number**	**Well Location**
MW1 (801) BACKGROUND WELL	801	264 feet NE from the NE corner of the primary lagoon (inside top of berm)
MW2 (802) DOWNGRADIENT WELL	802	24 feet SW from the SW corner of seepage cell #2 (inside top of berm)
MW1A (803) DOWNGRADIENT WELL	803	106 feet S from the south berm mid-point of seepage cell #2 (inside top of berm)
MW2A (804) DOWNGRADIENT WELL	804	43 feet W from the NE corner of seepage cell #2 (inside top of berm)

Groundwater standards contained in the most recent expired WPDES permit for the Lone Rock Wastewater Treatment Facility are:

PARAMETER	PAL	ES	Source
Chlorides	125 mg/L	250 mg/L*	Table 2, NR 140
Ammonia Nitrogen	2.1 mg/L	N/A	Calculated
NO_2-NO_3, N	6.1 mg/L (ACL)	10 mg/L*	Calculated, Table 1, NR 140
Organic Nitrogen	2.7 mg/L	N/A	Calculated
pH	5.9 – 7.9 s.u.	N/A	Calculated
TDS	280 mg/L	N/A	Calculated

* The Enforcement Standards for NO_2-NO_3, N and Chlorides are listed for reference.

The following groundwater limits are proposed for the upcoming Lone Rock WWTF WPDES permit:

PARAMETER	PAL	ES	Source
Chlorides	125 mg/L	250 mg/L*	Table 2, NR 140
Ammonia Nitrogen**	0.97 mg/L	9.7 mg/L*	Table 1, NR 140
NO_2-NO_3,N	5.1 mg/L (ACL)	10 mg/L*	Calculated, Table 1, NR 140
Organic Nitrogen	8.0 mg/L	N/A	Calculated
pH	6.5 – 8.5 s.u.	N/A	Calculated
TDS	280 mg/L	N/A	Calculated

* The Enforcement Standards for NO_2-NO_3, N, Ammonia Nitrogen and Chlorides are listed for reference.

** In January 2011 ammonia nitrogen became a health related parameter with a PAL of 0.97 mg/L and an ES of 9.7 mg/L.

Groundwater limits were calculated using the most recent 5 years (5/12/09 – 9/5/14) of monitoring data from background well MW-1(801).

Background Groundwater Quality

Background well(s): MW1 (801)

Background groundwater quality: During the current expired WPDES permit Chloride ranged from 2 – 19.5 mg/L; Nitrite + Nitrate-N ranged from 0.45 – 6.69 mg/L; Ammonia Nitrogen ranged from 0.02 – 0.93 mg/L; Organic Nitrogen ranged from 0.18 – 8.26; pH ranged from 6.72 – 8.08 mg/L; and TDS ranged from 6.6 – 145 mg/L (Erroneous high sample result of 887.54 submitted on 2/25/2013, was excluded from the data set). Organic Nitrogen had a few groundwater sampling spikes of 8.26, 4.55, 6.04 and 2.2 during this permit period which is why the new limit is significantly higher than the previous permit.

Known or suspected background contaminant sources: No suspected background contaminant sources.

Exceedence Report

This exceedence report is based on NR 140 Enforcement Standards (ES) and the groundwater limits contained in the current WPDES permit, using groundwater data collected from 5/12/2009 – 9/5/2014.

MW2 (802) DOWNGRADIENT WELL

1 of 21 sample results exceeded the Table 2, NR 140 PAL of 125 mg/L for Chlorides.

2 of 21 samples results exceeded the ACL of 6.1 mg/L for NO_2-NO_3, N.

14 of 21 sample results exceeded the PAL of 2.1 mg/L for Ammonia Nitrogen. Note: 6 samples are above the new ES of 9.7 mg/L for Ammonia Nitrogen.

5 of 21 sample results exceeded the PAL of 2.7 mg/L for Organic Nitrogen. Erroneous sample of 130 was submitted on 2/16/2011.

13 of 20 sample results exceeded the ACL of 280 mg/L for Total Dissolved Solids (TDS).

MW1A (803) DOWNGRADIENT WELL

8 of 21 samples results exceeded the ACL of 6.1 mg/L for NO_2-NO_3, N. 2 sampling results exceeded 10 mg/L.

3 of 21 sample results exceeded the PAL of 2.1 mg/L for Ammonia Nitrogen.

3 of 21 sample results exceeded the ACL of 2.7 mg/L for Organic Nitrogen.

1 of 20 sample results exceeded the ACL of 280 mg/L for TDS.

MW2A (804) DOWNGRADIENT WELL

11 of 21 samples results exceeded the ACL of 6.1 mg/L for NO_2-NO_3, N. 6 sampling results exceeded 10 mg/L

5 of 21 sample results exceeded the PAL of 2.1 mg/L for Ammonia Nitrogen.

10 of 21 sample results exceeded the ACL of 280 mg/L for Total Dissolved Solids (TDS).

Discussion

It appears the village of Lone Rock still owns property down gradient of the seepage cells to land owned by the DNR. The receptor of effluent discharged to the seepage cells is a lake that is an abandoned channel of the Wisconsin River. The distance from the seepage cells to the abandoned river channel is about 350 and 850 feet depending on which side of the seepage cells the distance is measured. Therefore, since Lone Rock WWTF discharges to groundwater which has a flow path to surface water, consideration is given not only to groundwater parameters that have human health related limits but also to parameters that may affect surface water quality and/or aquatic organisms.

Up gradient well MW1(801) is more than 250 feet from the seepage cells and technically meets the definition of a point of standards application well. However, due to the up gradient location of MW1(801) the Lone Rock WWTP is not the source of monitored parameters in MW1(801).

The down gradient monitoring data shows that the effluent to the seepage cells has impacted groundwater above NR 140 PALs and NR 140 ES, for nitrate+nitrite nitrogen and ammonia nitrogen.

Down gradient monitoring wells MW2(802), MW1A(803) and MW2A(804) are not point of standards application wells because they are on property owned by the village of Lone Rock and less than 250 feet from the seepage cells. Therefore, all down gradient monitoring wells are within the facilities design

management zone (DMZ), which means the two NO_2-NO_3, N, sampling results in MW1A(803) above 10 mg/L and the six sampling results in MW2A(804) above 10 mg/L are then considered ACL exceedences.

The ammonia nitrogen PAL exceedences in down gradient MW-2 (802) has increased in frequency and concentration during the 2009 – 2014 permit term, in comparison to the previous permit term (2004-2008). The increase in frequency and concentration means that the wastewater effluent is not properly nitrifying as it enters groundwater. Ammonia nitrogen is a parameter of concern for aquatic organisms as well as a human health related parameter. Given that the distance from the monitoring wells to the abandoned river channel is about 350 to 850 feet the Ammonia concentrations at the point where groundwater discharges to the abandoned channel of the Wisconsin River will be reduced below levels of concern for aquatic organisms.

The current groundwater monitoring system appears to be doing an adequate job monitoring the WWTF. There also appears to be no groundwater users between the seepage cells and the abandoned channel of the Wisconsin River.

Recognizing there are no groundwater users between the seepage cells and the abandoned channel of the Wisconsin River and the current amount of groundwater exceedences within the DMZ boundary are acceptable as it will not adversely affect the distant down gradient surface water; the Department considers Lone Rock WWTF in substantial compliance with its WPDES Permit.

Recommendations

- Monitoring Wells MW-1 (801), MW-2 (802), MW-3 (803) and MW4 (804) should be monitored quarterly for all the parameters listed in the previous WPDES permit. Note: Groundwater elevations should be measured to the (nearest 0.01 feet) prior to purging the monitoring well during its scheduled sampling event.
- This facility should consider implementing ammonia nitrogen reduction efforts to limit the discharge to groundwater as there appears to be additional exceedances than the previous permit term, including the fact ammonia nitrogen is now a health related parameter with a PAL of 0.97 mg/L and an ES of 9.7 mg/L. It is up to the Basin Engineer to decide if there needs to be a compliance schedule in the permit relating to ammonia nitrogen reduction efforts.