Manitoba Environment Act Proposal Municipality of Glenella-Lansdowne

April 2017

Dee Genaille, P.Eng

Environment Act Proposal Form

Manitoba
Sustainable Development

Name of the development:	Municipality of Glenella-Lansdowne Water Treatment Plant Upgrade
Type of development per Classes of Development Regulation (Manitoba Regulation 164/88):	Class 1- Waste Disposal
Legal name of the applicant:	Municipality of Glenella-Lansdowne
Mailing address of the applicant:	Box 10
Contact Person:	Wendy Wutkze - CAO
City: Glenella	Province: MB Postal Code: R0J 0V0
Phone Number: 204 352-4281	Fax: 204 352-4100 email: rmofglen@inetlink.ca
Location of the development:	Community of Glenella Water Treatment Plant
Contact Person:	Wendy Wutkze - CAO
Street Address:	Main Street
Legal Description:	NE 21-18-13 W
City/Town: Glenella	Province: MB Postal Code: R0J 0V0
Phone Number: 204 352-4281	Fax: 204 352-4100 email: rmofglen@inetlink.ca
Name of proponent contact person for purposes of the environmental assessment:	Dee Genaille
Phone: 204-726-6080 Fax:	Mailing address: Manitoba Water Services Board Unit 1A - Currie Blvd. Brandon, MB R7B 4E7
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Date: April 12, 2017	Signature of proponent, or corporate principal of corporate proponent: D Genaille Printed name:

PRINT RESET

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Executive Summary

The Manitoba Water Services Board (MWSB) has prepared an Environment Act Proposal (EAP) for a Class 1 Development License under the Manitoba Environment Act on behalf of the Municipality of Glenella-Lansdowne for the discharge of greensand filter backwash from the Glenella water treatment plant (WTP).

The existing Glenella WTP services 90 connections. Arsenic levels in the drinking water are elevated at 0.012 mg/L, which exceeds the maximum acceptable concentration (MAC) of 0.01 mg/L as per limits set by the Guidelines for Canadian Drinking Water Quality (GCDWQ) and was identified as an exceedance in the 2014 Compliance Plan for the Glenella Public Water System (PWS) submitted to the Office of Drinking Water (ODW). A pilot study conducted by KGS Group Consulting Engineers in November 2016 determined that greensand filtration reduces arsenic levels to meet the GCDWQ guidelines.

The proposed development includes the installation of a greensand filter in the Glenella WTP to reduce arsenic levels in the drinking water. A pipeline will be installed to discharge filter backwash to the Glenella Drain located north of the WTP across Provincial Road 261. The Glenella Drain flows east into the Big Grass River Angle Drain and into Jackfish Lake.

The expected greensand filter backwash will be discharged three times a week to the Glenella Drain at rate of approximately 0.6 L/s. The concentration of arsenic in the backwash would be 0.02 mg/L. Assuming an arsenic level of 0.34 mg/L for water quality in the Big Grass River, which is the high allowable limit of the Tier – II Water Quality Objectives as per the at the Manitoba Water Quality Standards, Objectives and Guidelines, the impact of the filter backwash on the Big Grass River during high and low flow conditions is expected to be negligible.

1.0 Introduction

The Manitoba Water Services Board (MWSB) has prepared an Environment Act Proposal (EAP) for a Class 1 Development License under the Manitoba Environment Act on behalf of the Municipality of Glenella-Lansdowne for the discharge of greensand filter backwash from the Glenella water treatment plant (WTP).

2.0 Description of Proposed Development

2.1 Project Description

The existing Glenella WTP services 90 connections. Raw Water is supplied from two ground water wells located northeast of Glenella. Currently the only treatment at the WTP is the addition of sodium hypochlorite for disinfection.

Analysis of the raw water shows arsenic levels of 0.012 mg/L, which exceeds the maximum acceptable concentration (MAC) of 0.01 mg/L as per the Guidelines for Canadian Drinking Water Quality (GCDWQ) and was identified in the 2014 Compliance Plan for the Glenella Public Water System (PWS) submitted to the Office of Drinking Water (ODW). A pilot study conducted by KGS Group Consulting Engineers in November 2016 determined that greensand filtration reduces arsenic levels to meet the GCDWQ guidelines.

It is proposed to install a greensand filter in the Glenella WTP to reduce arsenic levels in the drinking water. The Glenella WTP can accommodate the new filter and no building expansion or change to the existing infrastructure is required. Since the Community of Glenella does not have sewer system the greensand filter backwash is proposed to discharge to a wet well north of the WTP and be pumped 70 m via a 50 mm pipeline to the Glenella Drain. This is a 3rd order drain, located north of the WTP across Provincial Road 261. The Glenella Drain flows east to the Big Grass River and into Jackfish Lake.

2.1.1 Population

The Community of Glenella is located in the Municipality of Glenella-Lansdowne and has a projected 20 year population of 190 people.

2.1.2 Current and Projected Water Use

The average water use for the Community of Glenella is 150 L/capita/day. A peak-day factor of 2, which is a typical water consumption value, was assumed to determine a peak day value of 300 L/capita/day. The 20 year future average water demand is 0.40 L/s with a peak demand of 0.80 L/s.

2.1.3 Raw Water Source

The water source for Glenella is two groundwater wells located 6.5 km northeast of the Community in the municipal road allowance to the north of NW 36-18-13 W. The wells are 200 mm and 150 mm in diameter and approximately 15 m deep.

2.1.4 Water Rights Act

Water Rights Act Licence No. 2008-014 was issued to the Rural Municipality of Glenella for the diversion of water from a sand and gravel aquifer located in the municipal road allowance lying to the north of NW 36-18-13 W for municipal use. The maximum rate at which water may be diverted from the two wells is 0.0023 m^3/s and the total annual quantity shall not exceed 20.0 cubic decameters.

2.1.5 Water Quality

Parameters of concern in the raw and treated water for Glenella include arsenic, total dissolved solids, hardness and turbidity as shown in Table 1.2.

Table 1.2 Glenella Water Quality Results (2014)

Parameter	Unit	Raw Water	Treated Water	GCDWQ
Hardness (Total) as $CaCO_3$	mg/L	335	324	≤ 200/500 [a]
Arsenic	mg/L	**0.0119**	**0.0110**	0.01
Iron	mg/L	0.078	0.048	≤ 0.3
Manganese	mg/L	0.0423	0.0345	≤ 0.05
Total Dissolved Solids (TDS)	mg/L	**568**	**582**	≤ 500

[a] Hardness levels greater than 200 are considered poor but tolerable. Hardness levels greater than 500 are generally considered unacceptable.

2.1.6 Operation and Maintenance

The Municipality of Glenella-Lansdowne will be responsible for the operation and maintenance of the WTP. The existing WTP in Glenella is classified as a Small Facility. An application for classification will be completed to determine if the facility class will change with the installation of the greensand filter.

2.2 Project Schedule

The project is scheduled to commence in summer of 2017 and be completed in fall of 2017 depending on the receipt of all approvals.

2.3 Project Funding

This project is eligible for cost sharing between the MWSB and the Municipality of Glenella-Lansdowne subject to all approvals in place and availability of funding.

3.0 Potential Environmental Effects

An environmental effect includes any change that the project may cause to the environment.

3.1 Air Quality

Dust, gas emissions and particulates will result from construction methods and equipment and there will be gaseous and particulate emissions from the construction equipment. Any effects would be localized, temporary and insignificant. During operation of the development there will be no releases of pollutants to the air.

3.2 Soils

During construction, there is a risk of fuel or lubricant spills from heavy equipment and vehicle operation. During operation, project activities are limited to regular monitoring and maintenance activities that have a negligible effect on soil disturbance and compaction. The potential adverse effect on soil quality is assessed to be minor.

3.3 Surface Water, Fish and Fish Habitat

Monthly average flow data in m^3/s collected from hydrometric flow station (05LL026) located on the Big Grass River near Glenella, MB (Environment Canada) is summarized in Table 3.1. High flow through the Glenella Drain to the Big Grass River occurs during April when spring runoff is flowing from Riding Mountain.

Table 3.1 Monthly Mean Discharges for Big Grass River near Glenella, MB (m^3/s)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	-	-	0.844	3.3	10.5	15.9	6.05	2.17	0.736	1.32	-	-
2011	-	-	0.294	17.1	21.3	20.0	1.95	0.213	0.141	0.018	-	-
2012	-	-	0.278	0.404	0.772	1.19	0.134	0.002	0.00	0.00	-	-
2013	-	-	0.00	1.51	9.52	5.10	1.85	0.186	0.008	0.030	-	-
2014	-	-	0.005	11.4	17.9	6.65	9.45	1.42	3.91	1.14	-	-
2015	-	-	0.532	2.71	2.14	0.557	3.19	2.55	0.545	0.325	-	-

The Glenella Drain is shown below in Figure 3.1(a) and 3.1 (b). Discharge of the concentrate to the drain will be located approximately 70 m north of the WTP and 55 m upstream of a road crossing. During winter ice formation may occur as there is no flow in the drain. However due to the distance from the first road crossing, the size of the drainage ditch and the clearance under the bridged road it is expected that the impact of ice formation will be minor.

Figure 3.1(a) Discharge location to Glenella Drain to upstream of first road crossing.

Figure 3.1(b) Glenella Drain downstream of discharge location past first road crossing.

The expected greensand filter backwash will be discharged three times a week to the Glenella Drain at rate of approximately 0.6 L/s. The concentration of arsenic in the backwash would be 0.02 mg/L. Assuming an arsenic level of 0.34 mg/L for water quality in the Big Grass River, which is the high allowable limit of the Tier – II Water Quality Objectives as per the at the Manitoba Water Quality Standards, Objectives and Guidelines, the impact of the filter backwash on the Big Grass River during high and low flow conditions is expected to be negligible.

Table 3.2 Effects of Greensand Filter Backwash on River Quality

Parameter	Concentrate	Big Grass River	Combined Low Flow	Combined High Flow
	(L/s)	(L/s)	(L/s)	(L/s)
Flow Rate	0.6		404.6	17100.6
High		17100		
Low		404		
	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Arsenic	0.02	0.34	0.34	0.34

Impacts to fisheries and fish habitat are expected to be minor.

3.4 Groundwater Level and Quality

The impact to groundwater levels or quality resulting from the proposed project is unlikely to result in adverse changes.

3.5 Vegetation

Construction will occur primarily on Municipal owned property or within provincial or municipal right-of-ways that were previously disturbed, regularly managed and comprised

primarily of grasses. As these areas are already disturbed, they are unlikely to contain rare plant species. The amount of vegetation disturbance is expected to be minimal. During operation, monitoring and maintenance activities potential effects to vegetation are considered to be negligible.

3.6 Wildlife Habitat and Vegetation

The construction and operation activities associated with the upgrades to the WTP will be limited to an area already developed for urban use. The potential adverse effects of wildlife habitat loss were assessed to be negligible to minor.

3.7 Species at Risk

A search of the existing Manitoba Conservation Data Centre database identified the Golden-winged Warbler, Bank Swallow and Bobolink as threatened species as per the Committee of the Status of Endangered Wildlife in Canada (COSEWIC) route as well as Northern Leopard Frogs as a special concern along the proposed 30 km of discharge route from Glenella to Jackfish Lake. However construction for this project will only take place adjacent to the WTP and along PR 261 and Pr 462 which is a developed urban area with high traffic flow and few trees.

No occurrences of rare plant species exist in the project area at the time the request for information was made (Friesen, Chris. Personal communication. 20 March 2017).

3.8 Noise and Vibration

During the construction phase of the project, there will be several sources of sound emissions including equipment used for construction. The noise will be in addition to regular community and highway activities, and the effects are considered minor.

3.9 Employment/Economy

Negative socio-economic implications are not expected as a result of environmental impacts as impacts are considered minor and short-term. The potential effects of the project on employment and the economy in the Municipality were assessed to be positive.

3.10 Human Health and Well Being

The effects of the project on human health are assessed to be positive as it will improve water quality by reducing arsenic levels in the drinking water.

3.11 Climate Change

There are no predicted impacts to climate as a result of the project activities.

4.0 Environmental Management Measures

Environmental management practices proposed to prevent or mitigate environmental effects that were determined to be adverse are identified and described below.

4.1 Soils

Mitigation to potential impacts to soil from petroleum products include preparation of an emergency response plan, use of spill clean-up equipment, using properly maintained equipment and using appropriate fuelling equipment. Re-establishment of vegetation as soon as possible after disturbance will limit loss of soil due to wind or water erosion.

4.2 Surface Water

Mitigation of surface water issues will be achieved by redirecting surface water runoff and employing erosion control practices and silt fencing as required. Petroleum leaks or spills will be mitigated by use of properly maintained equipment, spill clean-up equipment and materials and appropriate fuelling equipment. In the event of a reportable spill Manitoba Sustainable Development will be notified. A 100 m setback to watercourses will be maintained for fuelling activities.

4.3 Species at Risk

Construction for this project will take place adjacent to the WTP and along PR 261 and Pr 462 which is a developed urban area with high traffic flow and few trees.

4.4 Noise and Vibration

Scheduling of various site activities for day-time hours will be done to avoid sleep disturbance and the disruption of evening domestic activities. All equipment used on site will be fitted with appropriate mufflers and will be maintained in good working order to minimize noise levels.

4.5 Ice Formation

Ice formation due to filter backwash being discharged to the Glenella Drain during winter months will be monitored and removed as necessary to ensure no negative impacts to flow during spring.

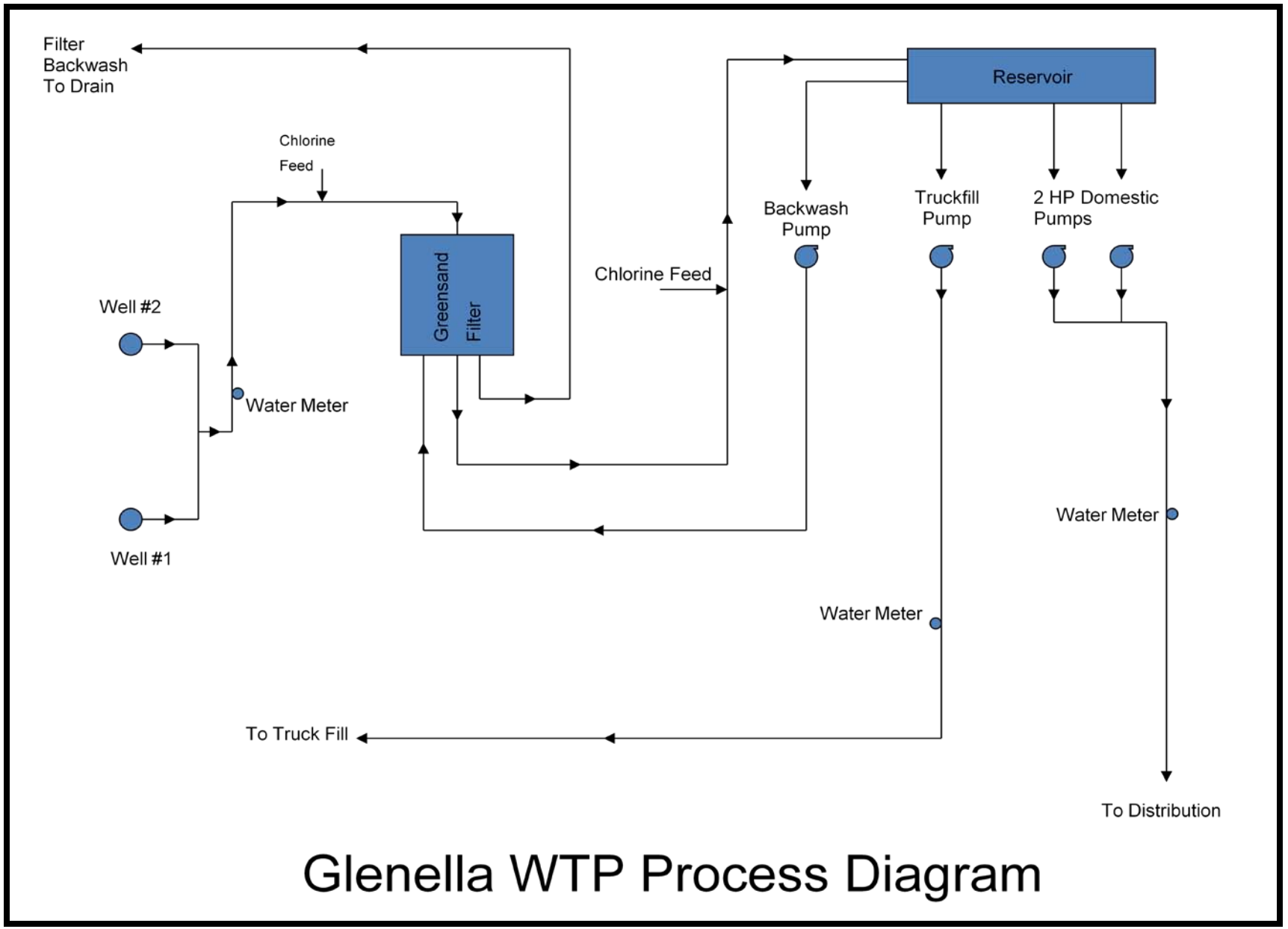
Appendix A

Proposed Discharge route


Glenella Drain
Glenella
WTP
Big Grass River
Jackfish Lake
10/13/2016

Appendix B

Process Flow Diagram


Filter
Backwash
To Drain
Chlorine
Feed
Greensand
Filter
Reservoir
Backwash
Pump
Truckfill
Pump
2 HP Domestic
Pumps
Chlorine Feed
Well #2
Water Meter
Well #1
Water Meter
Water Meter
To Truck Fill
To Distribution
Glenella WTP Process Diagram