Environment

HyLife Foods LP.

Notice of Alteration Request – HyLife Foods Pork Processing Facility and R3 Innovations Inc./Town of Neepawa lWWTF, Neepawa MB

Prepared by:

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Project Number:

60278554 (402.19.2)

Date:

June, 2013

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AECOM
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204 284 2040 fax

June 6, 2013

Ms. Tracey Braun, M.Sc.
Director, Environmental Assessment and Licensing
Manitoba Conservation and Water Stewardship
123 Main Street
Ste. 160 Union Station
Winnipeg, Manitoba R3C 1A5

Dear Ms. Braun:

Project No: **60278554 (402.19.2)**

Regarding: **Notice of Alteration Request – HyLife Foods Pork Processing Facility and R3 Innovations Inc./Town of Neepawa IWWTF, Neepawa, Manitoba**

Please find enclosed five hard copies and two electronic copies of the *Environment Act* Proposal form and supporting information to obtain approval for the construction and operation of upgrades to the existing HyLife Foods pork processing facility and IWWTF located in Neepawa, Manitoba filed on behalf of HyLife Foods and the Town of Neepawa. We understand that the proposed project at the HyLife Foods facility is a Class I development and the proposed project at the IWWTF is a Class II development under the Classes of Development Regulation and have accordingly included a cheque from HyLife Foods LP. in the amount of $5,500 to cover the application fee. We trust that the information on the form and the attached supporting information are sufficient.

Should you have any questions regarding the project or the attached information, please do not hesitate to contact Stephen Biswanger directly at 204-477-5381.

Sincerely,
AECOM Canada Ltd.

Ron Typliski, P.Eng.
Vice-President, Environment
Manitoba/Saskatchewan District
Canada West Region

KC/AW:dh

Print Form

Environment Act Proposal Form

Name of the development: HyLife Foods Pork Processing Plant	
Type of development per Classes of Development Regulation (Manitoba Regulation 164/88): Class I	
Legal name of the proponent of the development: HyLife Foods LP.	Mailing address: Box 100 La Broquerie, MB R0A 0W0
Location (street address, city, town, municipality, legal description) of the development: Town of Neepawa, Manitoba SW35-14-15 W.P.M.	
Name of proponent contact person for purposes of the environmental assessment: Sheldon Stott, P.Ag.	
Phone: 204-424-2313 Fax: 204-424-5177	Mailing address: Box 100 La Broquerie, MB R0A 0W0
Email address: Sheldon.Stott@Hylife.com	
Webpage address:	
Date: June 7, 2013	Signature of proponent, or corporate principal of corporate proponent: Printed name: DENIS VIELFAURE COO HYLIFE

A complete **Environment Act Proposal (EAP)** consists of the following components:

- **Cover letter**
- **Environment Act Proposal Form**
- **Reports/plans supporting the EAP** (see "Information Bulletin - Environment Act Proposal Report Guidelines" for required information and number of copies)
- **Application fee** (Cheque, payable to Minister of Finance, for the appropriate fee)

Per Environment Act Fees Regulation (Manitoba Regulation 168/96):

Class 1 Developments	$500
Class 2 Developments	$5,000
Class 3 Developments:	
Transportation and Transmission Lines	$5,000
Water Developments	$50,000
Energy and Mining	$100,000

Submit the complete EAP to:

Director
Environmental Assessment and Licensing Branch
Manitoba Conservation
Suite 160, 123 Main Street
Winnipeg, Manitoba R3C 1A5

For more information:
Phone: (204) 945-7100
Fax: (204) 945-5229
Toll Free: 1-800-282-8069, ext. 7100
http://www.gov.mb.ca/conservation/eal

Environment Act Proposal Form

Name of the development: Industrial Wastewater Treatment Facility (IWWTF)	
Type of development per Classes of Development Regulation (Manitoba Regulation 164/88): Class II	
Legal name of the proponent of the development: R3 Innovations Inc. & Town of Neepawa	Mailing address: Box 100 La Broquerie, MB R0A 0W0
Location (street address, city, town, municipality, legal description) of the development: Town of Neepawa, Manitoba SW 35-14-15 W.P.M.	
Name of proponent contact person for purposes of the environmental assessment: Sheldon Stott, P.Ag.	
Phone: 204-424-2313 Fax: 204-424-5177	Mailing address: Box 100 La Broquerie, MB R0A 0W0
Email address: Sheldon.Stott@Hylife.com	
Webpage address:	
Date: Town : June 4/13	Signature of proponent, or corporate principal of corporate proponent: HyLife Foods LP. / Town of Neepawa Printed name: DENIS VIELFAURE CAO, Town of Neepawa

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Distribution List

# of Hard Copies	PDF Required	Association / Company Name
5	2	Manitoba Conservation and Water Stewardship
1	-	Town of Neepawa
1	-	HyLife Foods LP.

Revision Log

Revision #	Revised By	Date	Issue / Revision Description
1	K. Cusitar	June 6, 2013	Final

AECOM Signatures

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Manager, Remediation, Impact Analysis & Approvals, Environment

APEGM
Certificate of Authorization
AECOM Canada Ltd. (MB)
No. 4671 Date: 2013/06/05

Executive Summary

HyLife Foods is proposing to increase pork processing capacity from 27,550 hogs/weeks to 37,500 hogs/week at their pork processing facility in Neepawa, Manitoba (currently governed by Clean Environment Commission (CEC) Order No. 1102). Part of the expansion includes the addition of processes to provide the option for casings and heparin production instead of the present ground intestine (hash gut) production. The proposed increase in processing and the casings/heparin options will require building expansions at the HyLife Foods pork processing facility.

The proposed changes at HyLife Foods will result in additional wastewater treatment requirements at the existing R3 Innovations Inc./Town of Neepawa Industrial Wastewater Treatment Facility (IWWTF) which provides treatment of all wastewater generated at the pork processing facility. The additional treatment infrastructure at the IWWTF will accommodate the changes in flow and loading while continuing to meet the requirements of *Environment Act* License No. 2870.

HyLife Foods and the IWWTF are located approximately 2.4 km east of the intersection of Provincial Highway No. 16 and Provincial Highway No. 5 in the western portion of SW 35-14-15 W.P.M in the Town of Neepawa, Manitoba.

This Notice of Alteration Request provides details of the proposed alterations at both HyLife Foods and the IWWTF and the predicted environmental effects as a joint submission based on advice from Manitoba Conservation and Water Stewardship Environmental Approvals Branch.

The proposed project includes:

The construction and operation of:

- **HyLife Foods**
  - Future casings/heparin operation
  - Cut floor expansion
  - Future welfare area
  - Future mechanical area
- **IWWTF**
  - 1 Additional aeration basin
  - 1 Additional blower unit (available on-site as backup)
  - 1 Additional membrane cassette in each membrane tank
  - Upgrading of sludge pumps

The start of the construction phase is dependent on approval by Manitoba Conservation and Water Stewardship, which is anticipated by July 2013. Depending on the date of approval, the cut floor expansion at the HyLife Foods pork processing facility is anticipated to begin in September 2013 (approximately nine months of construction). This will be followed by the construction of the casings/heparin line (approximately nine months of construction) and the employee welfare area (approximately six months of construction) that are anticipated to begin in the spring of 2014 Construction at the IWWTF is anticipated to begin in the spring of 2014 with an approximate construction schedule of nine months.

The environmental setting for this assessment was characterized using existing information sources and information collected during the 2008 Request for Alteration to the Town of Neepawa's Industrial Wastewater Treatment Facility and was updated as required. The proposed expansion areas have been previously disturbed and are either covered by gravel or are grassed. There were no rare/endangered plant or wildlife species within the Project Site and none of the areas to be disturbed are considered natural habitat.

An Open House was held on January 16, 2013 by AECOM, HyLife Foods and the Town of Neepawa to provide an opportunity to receive and convey information about the proposed changes at HyLife Foods and the IWWTF for all interested parties. It was observed that the attendees were interested in the project and were either neutral or

positive towards the project. Further, the low attendance at the Open House and the lack of questionnaires filled out indicates that there is little public interest in the project.

The potential environmental effects of the proposed project on environmental and socio-economic components were considered in the assessment. Based on the available information, documented assumptions and the implementation of mitigation measures identified in this environmental assessment, residual effects were considered to be negligible to minor in magnitude as a result of the proposed alterations at the HyLife Foods pork processing facility and IWWTF.

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1. Introduction and Background

1.1 Project Overview

HyLife Foods LP. currently operates the HyLife Foods pork processing facility in Neepawa, Manitoba (**Figure 1**) and operates under the Clean Environment Commission (CEC) Order No. 1102. As described in this Notice of Alteration (NOA) request, HyLife Foods LP. proposes to increase their pork processing capacity from 27,550 hogs/week to 37,500 hogs/week. Part of the expansion includes the addition of processes to provide the option for casings and heparin production instead of the present ground intestine (hash gut) production. The proposed increase in processing and the casings/heparin options will require building expansions at HyLife Foods as shown in **Figure 2**.

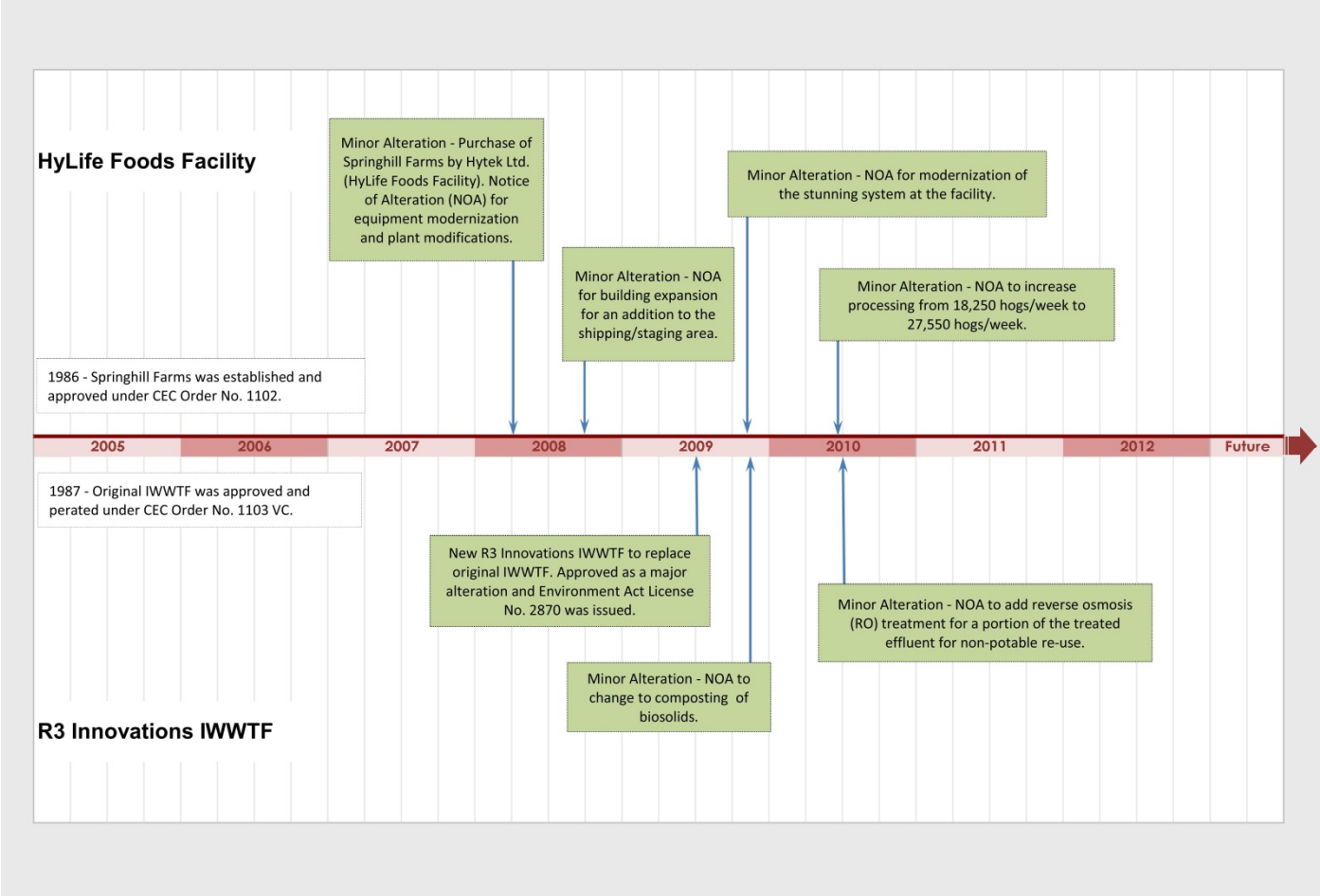
The alteration at the HyLife Foods pork processing facility will result in additional wastewater treatment requirements at the existing R3 Innovations Inc. Industrial Wastewater Treatment Facility (IWWTF) which provides treatment of all wastewater generated at the pork processing facility. The IWWTF operates in accordance with the requirements of *Environment Act* License No. 2870. HyLife Foods LP. (through their subsidiary R3 Innovations Inc.) and the Town of Neepawa are joint partners in the IWWTF. Additional treatment infrastructure at the IWWTF (as shown in **Figure 2**) will accommodate the changes in flow and loading while continuing to meet the requirements of the license

This NOA request has been prepared by AECOM Canada Ltd. on behalf of HyLife Foods LP. in accordance with Manitoba Conservation and Water Stewardship's Information Bulletin, "*Environment Act Proposal Report Guidelines*". This report documents the proposed alterations at the pork processing facility, the IWWTF and the resulting environmental effects and is submitted along with the *Environment Act* Proposal Form for consideration by Manitoba Conservation and Water Stewardship.

1.2 Previous Alterations

Since 2007, when HyLife Foods (formerly Hytek Ltd.) purchased the Springhill Farm facility, HyLife Foods LP. and the Town of Neepawa have progressively made improvements to the pork processing facility and the wastewater treatment system. The alterations that have occurred at the HyLife Foods pork processing facility and the IWWTF over the years are summarized below and details of the alterations are provided in **Sections 1.2.1** and **1.2.2**.

Timeline Summary



Note:

Timeline shown for submission application dates.

1.2.1 HyLife Foods Pork Processing Facility

In 2007, HyLife Foods LP. (formerly Hytek Ltd.) underwent a process of a share purchase of the Springhill Farms pork processing facility (now the HyLife Foods pork processing facility). In November of 2007, AECOM Canada Ltd. (formerly Earth Tech (Canada) Inc.) was retained by HyLife Foods LP. to prepare a NOA request for the pork processing facility. The 2007 NOA included the implementation of equipment modernization and plant modifications to allow the line speed in the cutting and packaging operations to match the kill speed of the plant. Further, the planned improvements would allow the redirection of carcasses that were sent to a third party processor, to be processed at the plant. The proposed changes were considered a minor alteration by Manitoba Conservation (now Manitoba Conservation and Water Stewardship) on December 19, 2007. The 2007 NOA also proposed on-site lard processing. The proposed lard processing was approved by Manitoba Conservation and Water Stewardship; however it has not been fully implemented as of the time of this submission.

A second NOA request was prepared by AECOM Canada Ltd. on behalf of HyLife Foods LP. in June of 2008 to allow a building expansion to accommodate an addition to the shipping/staging area. This proposed building expansion was approved as a minor alteration by Manitoba Conservation on July 22, 2008.

A third NOA request was prepared by AECOM Canada Ltd. on behalf of HyLife Foods LP. in August of 2009 to allow a modernization of the stunning system employed at the processing facility. The proposed alteration to the stunning system was approved as a minor alteration by Manitoba Conservation on August 31, 2009.

In March 2010, a fourth NOA request was prepared for the increase in processing from 18,250 hogs/week to 27,550 hogs/week. The alteration request included an increase in on-site live hog storage and the kill line speed, the implementation of a second cut shift, addition of a snap chill freezer and an increase in the size of the carcass cooler. This alteration was approved by Manitoba Conservation on September 27, 2010 as a minor alteration. Although the increase in the size of the carcass cooler and new snap chill was approved as part of the NOA request, they have not yet been implemented as of the time of this submission.

1.2.2 IWWTF

The original IWWTF was constructed in 1986/1987 and was operated under CEC Order No. 1103 VC. The original IWWTF included: an anaerobic cell, an anoxic cell, aerobic cells #1, #2 and #3, chlorination and dechlorination units including a rock filter and an effluent outfall to the Whitemud River, shown in **Figure 2** as the Former IWWTF. The IWWTF at that time could only provide limited treatment of the wastewater generated at the Springhill Farms pork processing facility (now HyLife Foods) and, as a result, effluent produced at the IWWTF was diverted to the Town of Neepawa Municipal Lagoon Cell #3 which was periodically discharged to the Whitemud River. This was an interim measure that was enacted to address poor effluent quality from the IWWTF.

AECOM Canada Ltd. (formerly Earth Tech (Canada) Inc.) submitted an NOA request in July 2008 to Manitoba Conservation (now Manitoba Conservation and Water Stewardship) to upgrade the IWWTF on behalf of the Town of Neepawa. The upgraded IWWTF was to allow the continuous discharge of treated effluent to a low area that would eventually flow to the Whitemud River and would no longer require the use of Municipal Cell #3. The proposed IWWTF included screens, a two stage dissolved air flotation (DAF) system in conjunction with a flow attenuation tank, activated sludge bioreactors, microfiltration membranes, ultraviolet (UV) disinfection, effluent cooling and aeration. One of the existing IWWTF lagoon cells was to be relined and divided into two cells to provide storage and isolation of biosolids in advance of land application. Manitoba Conservation approved the proposed development on February 26, 2009 and issued *Environment Act* License No. 2870 for the IWWTF.

In October 2009, AECOM Canada Ltd. prepared an NOA Request for alteration to the new IWWTF on behalf of the Town of Neepawa and HyLife Foods LP. The previously proposed biosolids management program was to include biosolids storage in a lined cell with biosolids being isolated for a period of approximately one year and applied to agricultural land in accordance with license requirements. The alteration was to change the method of biosolids management, so that biosolids would be transferred to a third party facility near Winnipeg, Manitoba for composting. The alteration to the sludge management program was approved by Manitoba Conservation as a minor alteration on November 18, 2009.

A second NOA request was filed in July 2010, to add reverse osmosis (RO) treatment for a portion of the treated effluent from the IWWTF. The RO treatment would allow the use of the RO treated water to cool the condensers used for cooling at the HyLife Foods pork processing facility. This alteration request was approved as a minor alteration on August 23, 2010 by Manitoba Conservation.

1.3 Regulatory Framework

Currently, under CEC Order No. 1102, the HyLife Foods pork processing facility is permitted to slaughter up to 27,550 hogs/week with all wastewater directed to the R3 Innovations Inc. IWWTF for treatment.

R3 Innovations Inc. operates the IWWTF and treats all wastewater from the HyLife Foods pork processing facility in accordance with the requirements of *Environment Act* License No. 2870.

HyLife Foods LP. and AECOM Canada Ltd. attended a meeting with Manitoba Conservation and Water Stewardship on August 24, 2012 to present the proposed alterations and confirm the regulatory context for the alterations. Manitoba Conservation and Water Stewardship indicated that the proposed alterations at the HyLife Foods processing facility and IWWTF would both be considered Major Alterations and therefore a NOA Request must be filed for consideration in each case. Manitoba Conservation and Water Stewardship further confirmed on March 1, 2013 that a single NOA submission outlining all of the proposed alterations would be required.

The proposed alterations at the pork processing facility and upgrades at the IWWTF are not listed on the *Regulations Designating Physical Activities* under the *Canadian Environmental Assessment Act,* 2012, and as such, no federal environmental assessment requirements are anticipated.

2. Project Description

2.1 Overview

HyLife Foods LP. is proposing to increase the pork processing capacity at the HyLife Foods pork processing facility from 27,550 hogs/week to 37,500 hogs/week. Part of the expansion includes the addition of processes to provide the option for casings and heparin production instead of the present ground intestine (hash gut) production. These changes will require more building space, more employees and will provide a modest increase in most aspects of the operations including trucking, water use and wastewater production.

The wastewater generated from pork processing operations, including sanitary services, the hog receiving facility and the on-site truck wash is treated at the IWWTF. In order for the IWWTF to continue to meet the existing *Environment Act* License No. 2870 requirements with the proposed expansion at the HyLife Foods pork processing facility, additional infrastructure is proposed at the IWWTF including; one aeration basin, a blower unit (available on-site as backup), additional membrane cassettes in each membrane tank and upgrading of the sludge pumps.

The following sections provide an overview of the existing operations at HyLife Foods and the IWWTF and the proposed alterations.

2.2 HyLife Foods Pork Processing Facility

2.2.1 Existing On-Site Facilities

Currently the HyLife Foods pork processing facility is licensed to process up to 27,550 hogs/week. Processing typically occurs over a five day period resulting in an average processing rate of 5,510 hogs/day.

A plant process schematic is shown in **Figure 3** which indicates the major steps in processing. The existing facility layout is shown in **Figure 4**. The following sections provide an overview of the existing processing steps at the HyLife Foods pork processing facility.

2.2.1.1 Receiving Facility

Hogs arrive at HyLife Foods in trucks and are unloaded from the trucks into a receiving facility. The receiving facility consists of unloading docks and receiving pens. The total capacity of the receiving facility is 4,000 hogs. Currently approximately 24 trucks/day (120 trucks/week) transport live hogs to the processing facility.

Hogs are held for a minimum of two hours in the receiving facility prior to proceeding to processing. During this time, the hogs are not fed and are allowed to rest. It is a standard operational practice that hogs be misted seasonally with a fine spray of water and are provided an opportunity to drink upon their arrival to calm and cool them as necessary. Sick hogs are separated out and sent to a quarantine pen for diagnosis. As required, animals are euthanized using the captive bolt gun method which is a Canadian Food Inspection Agency (CFIA) recommended practice. Dead on arrival (DOA) and euthanized hogs are stored in a dead stock bin located north of the processing facility next to the truck scrape out area. These hogs are sent offsite for rendering by a third party.

Wash water and solids flow from the receiving pens through a slotted floor where it is scraped into a holding tank and is then directed to the IWWTF for treatment.

2.2.1.2 Truck Wash

Once the trucks are emptied of hogs, they are scraped clean of bedding material and manure in a dry cleaning process. This scraped material is stored outside the hog holding facility in an area located north of the processing facility. This material is field stored and land applied annually in accordance with the requirements of the *Manitoba Livestock Manure and Mortalities Management Regulation (*MLMMMR).

Next, approximately 6 – 12 of the livestock trucks are washed in the on-site truck wash facility where water can be supplied from the facility's fresh water pipelines or can be supplied from the IWWTF's non-potable treated effluent stream (on-site utility water). Wastewater from the truck wash is directed to the IWWTF for treatment.

2.2.1.3 CO_2 Asphyxiation System

From the receiving facility, groups of approximately seven hogs are directed to the CO_2 asphyxiation system via push wagons operated by means of an electric motor drive. These hogs are then loaded onto an electric powered gondola and lowered into the CO_2 supply pit. The dwell time of the hogs in the gas is estimated at approximately 175 seconds. The gondolas with the asphyxiated hogs are then lifted out of the pit and the hogs are then moved onto a shackling table. The pit is washed down once a day; there is a pump at the bottom of the pit to send this wash water to the IWWTF for treatment. For worker protection, there are CO_2 sensors and alarms in place and safety interlocks to prevent workers from entering the chamber during operation. The asphyxiation system and dry ice system both use a 50 tonne aboveground steel CO_2 tank that is located on the north side of the HyLife Foods facility. Two trucks per month transport CO_2 to the site.

2.2.1.4 Dirty Kill Area

After the hogs are asphyxiated, the hogs are hung by their rear feet on a vertical conveyance system, stuck and bled. The carcasses are hung upside down to allow the blood to flow from the carcass into a shallow stainless steel reservoir located under the trolley system. An anti-coagulant (citrate) is added to the blood that is then screened and stored, where it is mechanically mixed and cooled.

Carcasses are then marked for tracking purposes and pulled through a scalding tank by the conveyance system where scalding opens the hair follicles for easy hair removal. The shackles are then removed and the carcasses enter a series of two dehairing machines. After the dehairing process, the toenails are clipped off and the carcass is reshackled. The removed hair and toenails are sent to the Evergreen Environmental Technologies Inc. landfill. Currently there are two trucks per day that transports the hair and toenails to the landfill.

The carcasses are singed to remove any remaining fine hairs using a singer and are then polished, manually checked for remaining hairs and scraped by hand if necessary. After this final step, the carcass is then sent to the clean kill area.

2.2.1.5 Clean Kill Area

Upon entering the clean kill area, the carcass belly is opened and the organs and edible offal are removed. The variety meat (edible offal) and hog heads are packaged for sale based on the market demand. The inedible organs and bones are sent to a third party renderer for processing. The hog intestines are separated and ground to produce hash guts.

Once all of the organs have been removed, the carcass is split and undergoes an inspection by a veterinarian to ensure no diseased tissues are present. They are then given a final rinse before being sent to the cooler. A cooler expansion and a new snap chill have been approved but have not yet been implemented at the site. Once implemented, the carcasses will spend 110 minutes in the snap chill area then will be stored in the carcass cooler prior to cutting.

2.2.1.6 Cutting Area

Once the carcasses are removed from the cooler area, they enter the cutting area. Typical equipment in this area includes stainless steel tables, band saws, and other cutting equipment. During this stage, the carcass is disassembled into primary and secondary cuts. Primary cuts consist of hams, bellies, loins, picnics, butts and spareribs while the secondary cuts consist of tails, hind feet, trimmings, belly skin, back skin, back fat, jowels, riblets, hocks, front feet and neck bones. All of these cuts are then separated into like parts which are then conveyed to the packaging area.

Any remaining bones are sent for third party rendering. Lard and cut fat are either directed to the rendering system or the lard processing stream depending on market demands. The lard processing stream has been approved but has not yet been implemented at the site.

2.2.1.7 Packaging

When separated parts arrive in the cooled packaging area, they are packaged to client specifications. Fresh or frozen products are then shipped in bulk to clients in Canada, the USA and Japan for either distribution or further processing.

2.2.2 Proposed Alterations

2.2.2.1 Increase in Processing

Currently, HyLife Foods processes 27,550 hogs/week and with the proposed alteration, the amount of hogs processed a week will increase to 37,500 hogs/week. This in turn will require more building space and more employees and will increase most aspects of the operations including trucking, water use and wastewater production.

With the proposed increase in hog processing at the facility, approximately 300 additional employees will be required, bringing the total number employees to approximately 1,250 at the pork processing facility. In order to process the 37,500 hogs/ week, the facility will require two kill and cut shifts as shown in **Tables 1** and **2**.

Table 1. Line Speed

	Proposed Condition (37,500 hogs/week)
Kill Line Speed – First Shift	500 hogs/hour
Kill Line Speed – Second Shift	250 hogs/hour and will ramp up 500 hogs/hour as hogs become available
Cut Line Speed – First Shift	500 hogs/hour
Cut Line Speed – Second Shift	250 hogs/hour and will ramp up 500 hogs/hour as hogs become available

Table 2. Shift Times

	Proposed Condition (37,500 hogs/week)
First Kill Shift	8:30 am to 5:00 pm
Second Kill Shift	5:00 pm to 1:30 am
First Cut Shift	6 am to 2:30 pm
Second Cut Shift	3:00 pm to 11:30 pm

Various areas of the facility will require an expansion to accommodate the further value added processing. The proposed expansion areas include the following and are shown in **Figure 4**;

- Future casings/heparin operation
- Cut floor expansion
- Future welfare area
- Future mechanical area

The following sections provide details on the proposed alterations at the HyLife Food pork processing facility.

2.2.2.2 Casings and Heparin Production

Currently, the HyLife Foods pork processing facility produces hash guts. This process involves collecting the small intestine, grinding it, mixing it with bisulfite, and then transporting the ground material off-site for further processing by a third party. There is no wastewater output from this process.

HyLife Foods is proposing to add a casings and heparin operation to the facility with the casings being sent off-site for use as natural casings for sausages. Heparin is an anticoagulant that prevents the formation of blood clots. The resin-attached heparin would also be shipped off-site for further processing. The production of casings and heparin is a flexible operation; the heparin line of the process can only be produced if casings are produced. As either hash guts or the casings/heparin can be produced at one time, HyLife Foods LP. proposes a flexible arrangement of either casings/heparin production or hash guts depending on market demand.

Similar to the hash gut process, the casings process would also involve collecting the small intestines however the intestines would remain intact for the casings operation. The small intestine would be cleaned and rinsed and then passed through a set of rollers to remove the internal mucose membrane. The flushing material would be sent to the IWWTF. The internal mucosa membrane is sent to a digestion tank. The remaining portion of the intestine would be inflated for grading, flushed with internal recycled water, and then placed into a 208 L barrel of salt water mixture created on-site. These drums would then be transported off-site.

The internal mucosa membrane collected is pumped into a digestion tank. Steam is introduced to the digester and once the temperature reaches 60ºC and the material has been digested for six hours, it would then be pumped into a separator to separate out the undigested food from the intestine. The undigested food would go to the IWWTF and the remainder of the material would go to an absorption tank where a contact media, “resin” would be added to the mixture. This material would remain in the absorption tank for five to six hours and then be pumped through a Sweco filter to separate the resin from the mixture with the remaining liquid (peptone) sent to the IWWTF. The resin with the attached heparin is placed in 208 L barrel. The heparin would be sent off-site for further refining and processing by a third party. The digester and tank would be cleaned with sodium hydroxide and caustic powder cleaner.

2.2.2.3 Proposed Infrastructure

The HyLife Foods pork processing facility will require an expansion in order to process the casings and heparin extraction as well as accommodate the additional staff required for the expanded operational capacity. The locations of the proposed expansion areas are shown in **Figure 4**.

The proposed expansion areas at the HyLife Foods pork processing facility include:

- A casings and heparin operation building (353 m^2)
- Expansion of the cut floor area (910 m^2)
- Addition of a future welfare area (364 m^2)
- Addition of a future mechanical area (176 m^2) that includes the following ancillaries:
    - Two 300 HP vilter low side ammonia compressors
    - One low side re-circulator
    - Two liquid ammonia pumps
    - One ammonia receiver
    - Two cooling towers
    - Two cooling tower water tanks or alternatively one large common tank
    - One distribution electrical panel
    - One crossover to high side to aid in cooling the hog coolers, if required

2.2.3 Water Use and Wastewater Production Summary

The following table provides a summary of water use and wastewater production under the existing processing rate of 27,550 hogs/week and the proposed processing rate of 37,500 hogs/week. The additional water required at the facility under the increased processing rate will be supplied by the Town of Neepawa potable water system and the non-potable utility water from the IWWTF. As shown in **Table 3**, the proposed increase in processing will increase the amount of wastewater produced. The additional flows and loads generated will continue to be treated within the licensed limits of the IWWTF, with the proposed additional treatment infrastructure.

Table 3. Water Use and Wastewater Production Summary

	27,550 hogs/week		37,500 hogs/week		Percent difference	
	Water Requirement	Wastewater Production	Water Requirement	Wastewater Production	Water	Wastewater
Truck Wash	1,193 m^3/week (17 m^3/week fresh water and 1,176 m^3/week internal recycle)	1,073 m^3/week	1,640 m^3/week (23 m^3/week from fresh water and 1,617 m^3/week internal recycle)	1,476 m^3/week	32% increase	32% increase
Receiving Facility	28 m^3/week	25 m^3/week	38 m^3/week	34 m^3/week	30% increase	31% increase
General Processing (kill and cut floor with 2nd shift, new and existing cooler, snap chill, new wet end) with sanitation	8,050 m^3/week	7,245 m^3/week	8,050 m^3/week	7,245 m^3/week	0%	0%
Lard Processing	14.3 m^3/week	58.9 m^3/week	19.5 m^3/week	80 m^3/week	31% increase	30% increase
Employees	443 m^3/week	402 m^3/week	790 m^3/week	715 m^3/week	56% increase	56% increase
Casings/Heparin			137 m^3/week	77 m^3/week	200% increase	200% increase
TOTAL	8,552 m^3/week (excluding internal recycle)	7,746 m^3/week (excluding internal recycle)	9,057.5 m^3/week (excluding internal recycle)	8,172 m^3/week (excluding internal recycle)	6% increase	5.4% increase
	1,222 m^3/day average weekly equalized flow (excluding internal recycle)	1,107 m^3/day average weekly equalized flow	1,293 m^3/day average weekly equalized flow (excluding internal recycle)	1,167 m^3/day average weekly equalized flow		

2.3 IWWTF

2.3.1 Existing On-Site Facilities

All wastewater generated from the HyLife Foods pork processing facility including; the processing operations, sanitary use, the hog receiving facility and the on-site truck wash is treated at the IWWTF. Wastewater is also generated within the IWWTF from employee bathrooms, break room and the on-site laboratory. The existing IWWTF process schematic is shown in **Figure 5** and the existing facility layout is shown in **Figure 6**. The following sections provide an overview of the treatment process at the existing IWWTF.

2.3.1.1 Pretreatment

Wastewater from the on-site truck wash passes through a rotary drum screen prior to being discharged to the IWWTF. The filtered material from the rotary drum screen includes manure solids, straw and shavings that are collected and stored with the truck scrapings and are land applied as described in **Section 2.2.1.2**. HyLife Foods passes the wastewater from the processing operations through a screen and Dissolved Air Flotation (DAF) unit prior to transfer to the IWWTF. The material removed via the screens and DAF are disposed of at an off-site third party rendering facility. After the process water passes through the screen and DAF, it is transferred directly to a manhole

and is combined with the sanitary wastewater, the hog receiving facility wastewater and the truck wash wastewater. This combined wastewater flows by gravity from the manhole to a raw water influent pump station that conveys the flow to the screening/pumping building at the IWWTF via a forcemain.

2.3.1.2 Initial Treatment

At the IWWTF, the wastewater is screened to remove solids. These solids are transferred to a bin and disposed of at an approved landfill. The wastewater generated within the IWWTF from employee bathrooms, break room and laboratory as well as drain water from the screening/pumping and treatment buildings are also transferred to the screen to undergo treatment with the flows from the raw water pump station. Drain water includes water directed to floor drains during IWWTF building cleaning as well as the liquid stream generated during the thickening of waste activated sludge (WAS).

Screened effluent flows by gravity to the first DAF of the two stage DAF system. Metal salt and polymers are added to the flow to enhance the removal of suspended solid materials and fats contained in the wastewater. Effluent from the first stage DAF flows to a wet well prior to pumping to the flow attenuation tank. Sludge from the first stage DAF is managed as described in **Section 2.3.1.7**.

Magnesium hydroxide is added to the water prior to the flow attenuation tank to adjust the pH. The attenuation tank is an aboveground covered and insulated steel tank equipped with a mixing system to prevent solids from settling. The attenuation tank is sized to provide approximately 2.5 days of storage at the average design flow rate of 1,520 m^3/day; with the tank filling during the week and draining throughout the two day weekend. The remaining 0.5 days of storage is used as a minimum water level to ensure the tank can be mixed and the wastewater quality leaving the tank remains consistent. From the attenuation tank, the liquid is pumped to the second stage DAF.

Prior to treatment in the second stage DAF, metal salt and polymer is added to coagulate and flocculate the solids for higher removal percentages. The second stage DAF has only been used on a trial basis since IWWTF start-up in June 2010. Experience shows that the facility can meet license limits without the second stage DAF at the current flows and loads associated with processing 27,550 hogs/week at HyLife Foods. Accordingly the second stage DAF will be brought on-line based on flow and treatment needs to continue to meet license conditions. The effluent from the second stage DAF is pumped to a standpipe/wetwell prior to being pumped to the anoxic tank.

2.3.1.3 Activated Sludge and Membrane Bioreactor Treatment Process

The activated sludge process relies on the growth of suspended bacteria to consume organic material from the wastewater. The bacteria convert the organic material, chemical oxygen demand (COD) and biochemical oxygen demand (BOD) into bacteria biomass. In doing so, nitrogen and phosphorus are taken out of solution to support the bacterial growth. The biomass is wasted to a sludge hopper on a continuous basis to keep their concentration constant.

Within the anoxic tank, denitrification occurs where nitrate is transformed back into nitrogen gas and is released to the atmosphere. Metal salt is added to the tank to further reduce the soluble phosphorus concentration in the liquid stream. Magnesium hydroxide is also added to adjust the pH. The anoxic tank is an aboveground insulated steel tank equipped with a floating mixer.

From the anoxic tank, wastewater flows are split evenly with each stream being pumped to one of two aeration tanks where the wastewater is aerated using membrane diffusers. These tanks are aboveground insulated steel tanks. Within the aeration tanks, nitrification occurs where ammonia is converted to nitrate. The activated sludge is returned via a pump from the aeration tanks to the anoxic tank to fuel the denitrification process.

From each aeration tank, the flow is directed to the post anoxic tanks. There are two post anoxic tanks; one for each aerobic tank. The post anoxic tanks are aboveground insulated steel tanks. A sugar dosing system is in place to serve as a carbon source and facilitate additional nitrate removal, if necessary. Operational experience has shown that the sugar dosing system has not been required to date.

From the post anoxic tanks, flow is directed to the membrane bioreactors (MBRs) where solids separation takes place. There are two MBRs; one for each post anoxic tank. Each membrane unit consists of a rectangular tank with membrane elements in two cassettes immersed in the tank. Permeate from the membranes is combined in a common header and is pumped to the UV disinfection system, whereas the concentrated activated sludge bacteria is returned to the aeration tank and a portion of the sludge is wasted and sent to a sludge hopper (as described in **Section 2.3.1.7**).

2.3.1.4 Disinfection

The membrane permeate has a very low suspended solids concentration and turbidity and is therefore relatively easy to disinfect. Disinfection is achieved using a closed conduit UV disinfection system. This system is a low pressure high intensity system and has two units operating with one unit as duty and the second unit as standby.

2.3.1.5 Non-Potable Utility Water

After passing through the UV disinfection system, a portion of the effluent can be directed for use as non-potable utility water at the IWWTF and HyLife Foods pork processing facility. The IWWTF has two options for treatment of non-potable utility water:

- Direct use (with chlorination depending on use)
- Reverse Osmosis (RO) treatment

The direct use of the non-potable utility water includes water used for internal plant processes such as dilution water for chemical dosing systems and screen washing; this water is not chlorinated. The direct use of the non-potable utility water can also include use in the on-site truck wash. The water used in the truck wash is chlorinated before use.

The RO treated water is used in the HyLife Foods cooling system where it is fed into a condenser cooling system as a supplement to the existing water supply to offset the facility's total water demand.

The RO treatment unit is housed in the IWWTF treatment building (**Figure 6**). The RO treatment includes the addition of an antiscalent to the RO feed water to reduce scaling on the RO membranes. This antiscalent is certified under ANSI-NSF Standard 60 for drinking water production and is non-toxic. A chemical buffer is also added to maintain the pH at approximately 7. To date, the RO unit has been fully commissioned and will be available for full service in May 2013. It is intended that the RO system be used during the summer months with only minimal operation from October to April. The RO process results in the generation of reject water that is discharged with the treated effluent.

2.3.1.6 Effluent Cooling and Outfall

From the UV disinfection system, the treated wastewater flows to a cooling process that includes a cascade type system and also provides aeration of the effluent at ambient conditions. From the cooling process, treated effluent flows by gravity to an effluent outfall that eventually discharges to a low lying area near the Whitemud River as shown in **Figure 6**. There is riprap in place at the end of the outfall to prevent erosive impacts due to the discharge.

2.3.1.7 Sludge

There are three sludge streams generated at the IWWTF:

- Sludge from the first stage DAF
- Sludge from the second stage DAF (not currently in use)
- Waste Activated Sludge (WAS) produced in the membrane bioreactors

Sludge generated in the first stage DAF drains to a sludge hopper. The second stage DAF has only been used on a trial basis since the IWWTF start-up in June 2010. When the second stage DAF is in use, the sludge produced is also transferred to the same sludge hopper. Sludge from the sludge hopper is combined with WAS and is fed into two centrifuges.

Centrate from the centrifuges is transferred to the flow attenuation tank for treatment whereas dewatered sludge is transferred to a roll-off type bin. BFI Canada Ltd. collects the roll-off bins and manages the disposal of the sludge at their facility near Winnipeg in the Rural Municipality of Rosser.

A tricanter process to fractionate the fat from the sludge prior to dewatering was approved for the IWWTF, however has not been implemented to date.

2.3.2 Proposed Alterations

HyLife Foods LP. is proposing to increase their processing rate from 27,550 hogs/week to 37,500 hogs/week and are also proposing to add operations for the production of casings and heparin. To accommodate the wastewater generated by the expansion at the HyLife Foods facility, the following additional IWWTF infrastructure is proposed in order to continue to meet license conditions with the proposed additional processes at the processing plant:

- 1 Additional aeration basin
- 1 Additional blower unit (available on-site as backup)
- 1 Additional membrane cassette in each membrane tank
- Upgrading of sludge pumps

The following sections provide details on the proposed alterations at the IWWTF.

2.3.2.1 Design Basis for Proposed Alteration

The original design of the IWWTF was based on a maximum pork processing rate of 27,550 hogs/week. This processing rate was anticipated to generate up to 2,128 m^3/day of wastewater on a production day, while the average weekly equalized flow of wastewater was anticipated to be 1,520 m^3/day.

Pharmer Engineering was retained by HyLife Foods LP. to assess the need for upgrades at the IWWTF with the proposed increase in pork processing and the addition of the casings and heparin processes at the HyLife Foods pork processing facility. As part of their assessment, Pharmer Engineering examined the IWWTF design influent flows and loads and compared them to the actual flows and loads associated with an approximate pork processing rate of 19,000 hogs/week (the pork processing rate at the time of the assessment in April 2012) using a single kill shift and two cut shifts.

Using the actual flows and loads associated with processing 19,000 hogs/week, projections were made to determine the flows and loads associated with processing the proposed 37,500 hogs/week (using two kill shifts and two cut shifts). Projections were also made to estimate the flows and loads associated with the casings line and heparin extraction process resulting in the generation of the peptone waste stream.

The design influent, the actual influent at 19,000 hogs/week, the projected influent at 37,500 hogs/week, the projected influent from the peptone waste stream and the total projected IWWTF influent are summarized in **Table 4** (from *Further Expanded Flows and Loads R3 Industrial WWTP Process Engineering Evaluation* - Pharmer Engineering Report included in **Appendix A**).

Table 4. Influent Flows and Loads

		IWWTF Design at 27,550 hogs/week	Actual Influent at 19,000 hogs/week	Estimated Influent at 37,500 hogs/week	Estimated Influent Peptone Waste Stream	Total Estimated Influent at 37,500 hogs/week including the Peptone Waste Stream
Flow	m^3/day	1,520	777	1,040	15	1,055
BOD	kg/day	2,184	1,747	3,436	2,587	6,023
	mg/L	1,437	2,249	2,249	8,318	3,275
COD	kg/day	3,135	2,508	4,932	3,713	8,645
	mg/L	2062	3,228	3,228	11,940	4,701
TSS	kg/day	513	339	667	156	823
	mg/L	338	436	437	502	448
TKN	kg/day	513	339	667	156	823
	mg/L	338	437	437	502	448
TP	kg/day	45	38	75	28	103
	mg/L	30	49	49	90	56
Temperature	^oC	25-30	25-30	25-30	25-30	25-30

Source: Pharmer Engineering Report included in Appendix A

Since April 2012, when the evaluation by Pharmer Engineering was completed, HyLife Foods has increased their processing up to the licensed limit of 27,550 hogs/week. Based on the actual wastewater production at the current operating rate of 27,550 hogs/week, HyLife Foods estimates that the proposed alterations will produce approximately 1,100 to 1,200 m^3/day of wastewater (slightly more than the Pharmer Engineering projected flow of 1,055 m^3/day shown in **Table 4**). HyLife Foods does not anticipate that the quality of the wastewater would vary substantially from the projected quality shown in **Table 4**. For the purposes of this assessment, it was assumed that the proposed alterations would result in 1,200 m^3/day of wastewater generated.

2.3.2.2 Process Evaluation

Pharmer Engineering undertook an evaluation of the existing IWWTF infrastructure's ability to treat the projected flows and loads associated with the proposed increase in processing and the peptone waste stream. The following points provide a summary of the process evaluation included in Pharmer Engineering's report included as **Appendix A**.

- The influent screening and pumping facilities are sized for 4,540 L/min (6,538 m^3/day) and are anticipated to be adequate for the projected influent flows and loads.

- The first stage DAF is sized to treat flows from the raw influent pump station or the screened wet well. The first stage DAF is anticipated to be adequate for the projected influent flows and loads. **Additional pH adjustment (using ferric chloride)** may be required in the primary DAF to denature protein and break oil and grease emulsions to improve removals prior to the biological treatment process.

- The flow attenuation tank can provide 2.5 days of storage at the average design flow rate of 1,520 m^3/day. It is anticipated that the flow attenuation tank will be adequate for the projected influent flows as the projected flows are closer to the original design condition.

- The second stage DAF is in place, however has only been used on a trial basis since IWWTF start-up as the system has been able to operate without it. The second stage DAF is anticipated to be adequate for the proposed alterations.

- The activated sludge process will require **an additional aeration tank** (760 m^3 in size) to maintain an aerobic solids retention time (SRT) of at least 22 days. There is adequate blower capacity available at the IWWTF to accommodate the increased flows and loads, however redundancy will be lost. As such, **an additional blower unit is proposed as backup**.

- The existing membrane system includes two membrane tanks with two membrane cassettes each. The additional flows and loads will require **an additional third membrane cassette in each membrane train**.

- The existing UV disinfection units are each sized for 120% of the design flow (1,825 m^3/day) to allow for system redundancy. With the proposed increase inflow, an additional UV module is proposed to maintain sufficient system redundancy.

- No changes to the effluent cooling process are proposed.

- The centrifuges used to dewater the biosolids were designed for a load greater than the theoretical design to reduce wear and increase performance. The centrifuges are fed by centrifuge pumps that are operated at the maximum pumping rate of 1.7 L/s for each pump. The increase in processing is anticipated to require the centrifuges to operate 12 – 14 hours/day. The operation of the pumps for more than 12 hours does not allow for adequate system redundancy and as such **the centrifuge feed pumps are proposed to be replaced with higher capacity pumps** to reduce operation time.

2.3.2.3 Proposed Infrastructure

The design of the proposed infrastructure has not yet been completed; however, the proposed infrastructure is anticipated to be similar in construction to the existing IWWTF components. The conceptual layout of the proposed new infrastructure at the IWWTF is provided in **Figure 6**.

The infrastructure proposed at the IWWTF includes:

- One 14.3 m diameter aboveground insulated steel aeration tank including piping connections to the treatment train
- One blower unit (available on-site as backup)
- Two membrane cassettes (one for each membrane tank)
- Two replacement sludge pumps

2.4 Construction Inputs and Outputs

During the construction phase of the project, materials required may include pipes, concrete, steel, rebar, survey tape, paint spray cans, drywall, flooring, gravel, fill, fuel and other materials. Raw materials such as gravel, fill and asphalt will be required for site works. Most of these items will be brought in from other sites. Other materials that may be brought to the site of HyLife Foods include lockers, toilets sinks and other materials. Materials required to construct the proposed infrastructure at IWWTF include items from manufacturers (pumps, blower unit, membrane cassettes) as well as the steel tank components.

Surface runoff during construction will be typical of a construction site. Construction debris will be kept to a minimum through implementation of good housekeeping measures to ensure that surface runoff quality is not affected. Packaging materials, solvents, surplus building materials, used oils, etc. generated during construction will be transported from the site and disposed of, according to existing regulations, on a regular basis.

2.5 Operational Inputs

2.5.1 HyLife Foods

HyLife Foods LP. proposes to increase the amount of hogs processed a week from 27,550 hogs/week to 37,500 hogs/week and this will in turn increase the operational inputs into the facility such as hogs, chemicals and fuels. The following table summarizes the current and proposed operational inputs of the pork processing facility.

Table 5. Current and Proposed Operational Inputs

Inputs	Current Condition (27,550 hogs/week)	Proposed Condition (37,500 hogs/week)
Citrate	170 kg/day	231 kg/day
Natural Gas	4,500,000 m^3/year	4,500,000 m^3/year
CO_2 (stunning)	9,092 kg/week	12,375 kg/week
CO_2 (dry ice)	12,300 kg/month	25,275 kg/month
Diesel (skid steer)	165 L/week	175 L/week
Bisulfite for casings processing	N/A	4,355 L/week
Sodium hydroxide for casings processing	N/A	3,405 L/week
Resin for casings processing	N/A	2,043 L/week
Chlorinated detergent	1,027 L/week	1,078 L/week
Foaming acid cleaner	31 L/week	32.5 L/week
Caustic powder cleaner	300 kg/week	315 kg/week

Citrate, an anti-coagulant is added to the blood that is collected in a shallow stainless steel reservoir from the hog carcasses. Currently, 170 kg/day of citrate is used and with the proposed increase in pork processing at the facility, citrate use will increase to 231 kg/day.

There will be no increase in natural gas usage for building and process heat at the HyLife Foods pork processing facility due to the increased hog processing.

CO_2 is used in the stunning system as described in **Section 2.2.1.3** and dry ice is used for packaging the cut meat. The proposed increase in pork processing will increase the CO_2 use to 12,375 kg/week (stunning) and 25,275 kg/month (dry ice). The CO_2 and dry ice are both stored in a 50 tonne aboveground steel tank located on the north side of the HyLife Foods facility. A second 50 tonne CO_2 tank is presently being installed to provide sufficient redundancy to the asphyxiation system.

Currently at HyLife Foods, a skid steer is used to move dead hogs to a dead stock storage bin. Due to the proposed increase in pork processing at the facility, diesel used in the skid steer is estimated to increase by 10 L/week.

Bisulfite will be used in the heparin process. Bisulfite will be stored in a 20,000 L tank within the HyLife Foods building. Bisulfite will be received on-site in tankers and approximately 4,355 L/week of bisulfite will be used at the pork processing facility.

Sodium hydroxide used in the heparin process and resin will be stored within the HyLife Foods building in an approved aboveground 15,000 L tank.

With the proposed increase in hog processing, cleaning chemicals including chlorinated detergent (1,078 L/week), foaming acid cleaner (32.5 L/week) and caustic powder cleaner (315 kg/week) use will increase. These chemicals are used throughout the pork processing facility. All chemicals will continue to be stored in the chemical storage room which has adequate room for the increased amount of chemicals required.

With the increase in the above chemicals and fuel required at the site, this in turn will increase the amount of trucks travelling to/from the site. Further information regarding the amount of trucks travelling to/from the site is provided in **Section 2.7**.

2.5.2 IWWTF

The main operational input to the R3 Innovations IWWTF will be influent wastewater from HyLife Foods (characterized in **Section 2.3.1.1**). Influent flow and quality will continue to be monitored at the wet well prior to the fine screen at the front of the initial treatment train.

Natural gas will continue to be used for building heat. Electrical power will continue to be supplied by Manitoba Hydro. Potable water will continue to be supplied by the Town of Neepawa. Diesel fuel will continue to be used for an on-site truck that is used to move the BFI bin that stores the sludge produced at the IWWTF. Currently, 852 L/year of diesel is used but with the proposed increase in pork processing at HyLife Foods, the diesel usage will increase by 35% to 1,150 L/year.

Chemicals are used at the IWWTF for membrane cleaning and are dosed to the water at various treatment stages. Chemical delivery to the IWWTF is approximately once every two weeks and is estimated to increase by 25% due to the increase in pork processing at HyLife Foods. The following table presents the anticipated chemical usage at the IWWTF.

Table 6. Anticipated Chemical Usage at the IWWTF

Chemical	Description	Estimated Usage	Storage Size	Dangerous Good
Citric acid	Membrane bioreactor clean in place chemicals	1,670 litres per year	208 L drum (typically made of polyethylene)	No
Ferric Chloride	Dosing chemical for wastewater treatment	1,494 kg/day	23 m^3 polyethylene tank with secondary containment	Yes
Magnesium Hydroxide	Alkalinity for wastewater treatment	1,026 kg/day	23 m^3 painted steel tank	No
Polymer	Flocculant for wastewater treatment (including sludge dewatering)	151 kg/day	920 L polyethylene totes with secondary containment	No
Sodium hypochlorite	Membrane bioreactor clean in place chemicals	2,600 litres per year	920 L polyethylene totes with secondary containment	Yes
Sugar (or similar carbon source)	Carbon source for wastewater treatment	130 kg per day	23 m^3 polyethylene tank	No

2.6 Operational Outputs

2.6.1 HyLife Foods

The proposed increase in processing at HyLife Foods will in turn increase the operational outputs from the pork processing facility such as domestic waste, blood and final product. The following table summarizes the current and proposed operational outputs of the pork processing facility.

Table 7. Current and Proposed Operational Outputs

Inputs	Current Condition (27,550 hogs/week)	Proposed Condition (37,500 hogs/week)
Domestic Waste (to Landfill)	4 tonnes/week	6 tonnes/week
Recyclable Material	2,775 kg/week	3,777 kg/week
Hair and Toenails (to Landfill)	21 tonnes/week	29 tonnes/week
Bedding Material (land applied MLMMMR)	7,752 m^3/week	10,552 m^3/week
Renderable Material	357,500 kg/week	487,500 kg/week
DOAs	183 hogs/week	249 hogs/week
Blood	110,200 L/week	150,000 L/week
Casings/Heparin (208 L barrel)	N/A	10 barrels/week
Final Product	2,992 tonnes/week	4,073 tonnes/week

Domestic solid waste is collected from the pork processing facility and is removed daily by truck. It is estimated that with the proposed increase in pork processing, 6 tonnes/week of domestic solid waste will be removed from the facility annually. Also, with the proposed increase in pork processing, 3,777 kg/week of recyclable material (cardboard) will be removed from the facility weekly.

Approximately 21 tonnes of hair and toenails are currently collected per week from the HyLife Foods pork processing facility and are disposed of at the authorized Evergreen Environmental Technologies landfill. With the proposed increase in processing, this will increase to 29 tonnes/week and will continue to be sent to the landfill.

Renderable material including inedible organs, bone and trimmings along with the DOA and condemned hogs are sent for off-site rendering at a current rate of approximately 357,500 kg/week and 183 hogs/week, respectively. The increase in processing will increase the amount of renderable material to 487,500 kg/week and DOA and condemned hogs to approximately 249 hogs/week. Communication with the third party rendering company by HyLife Foods LP. has confirmed that sufficient capacity exists to accept the increased renderable product load.

The increase in processing at HyLife Foods LP. will increase the amount of blood collected. Currently approximately 110,200 L/week of blood is collected and is sent off-site to a third party blood processor. The increase in processing will increase the volume of blood collected to 150,000 L/week. There is currently one blood tank on-site located near the kill floor. The proposed increase in collected blood will not require any changes to the current blood storage system as the increased frequency of collection will accommodate the increase in blood collection.

Currently approximately 2,992 tonnes/week of final product is produced at the pork processing facility. The proposed increase in processing will increase the final product produced at the facility to approximately 4,073 tonnes/week. Increases in water requirements and wastewater production as a result of the increased processing are discussed in **Section 2.2.3**.

The increase in the operation outputs from the site will increase the amount of trucks entering/leaving the site. Further information regarding the amount of traffic associated with the changes is provided in **Section 2.7**.

2.6.2 IWWTF

2.6.2.1 Anticipated Effluent Characteristics

Treated wastewater will be the most prominent output from the IWWTF. Up to 1,200 m^3/day of treated wastewater will be discharged from the IWWTF when HyLife Foods is operating at full production (37,500 hogs/week). The discharge will continue to occur via the existing effluent outfall pipeline to the low area near the Whitemud River with effluent discharging on a continuous basis. The proposed alterations at the IWWTF are anticipated to allow expansion at the HyLife Foods pork processing facility while still meeting treatment requirements of IWWTF *Environment Act* License No. 2870 (as shown in **Table 8**).

Table 8. Environment Act License No. 2870 Effluent Discharge Criteria

Parameter	Value
Carbonaceous 5-day Biochemical Oxygen Demand ($CBOD_5$)	<25 mg/L
Total Suspended Solids (TSS)	<25mg/L
Total Nitrogen (TN)	<15 mg/L (based on 30 day rolling average)
Total Phosphorus (TP)	<1 mg/L (based on 30 day rolling average)
Fecal Coliform	<200/100 mL (based on 30 day geometric mean)
Escherichia coli (E.Coli)	<200/100 mL (based on 30 day geometric mean)

Historic 2012 compliance data provided by R3 Innovations Inc. shows that the IWWTF for the most part can exceed the treatment requirements of *Environment Act* License 2870. R3 Innovations staff conducts effluent monitoring on a daily basis and provide monthly compliance reports to Manitoba Conservation and Water Stewardship. The following table provides a summary of the average 2012 effluent quality.

Table 9. Average 2012 Effluent Quality

	Average 2012 Effluent Concentrations	Environment Act License Limits
Total Nitrogen (mg/L)	12.4	15
Total Phosphorus (mg/L)	0.5	1
Total Suspended Solids (mg/L)	5.1	25
5-day Carbonaceous BOD (mg/L)	7.5	25
Fecal Coliform (MPN/100 mL)	<3	200
E. Coli (MPN/100 mL)	<3	200

A portion of the treated effluent can be recycled for use at the facility as non-potable utility water (as described in **Section 2.3.1.5**). This practice will continue for the proposed alterations and will be operated as described in the previous NOA request (July 2010).

In rare cases, process upsets may occur for a variety of reasons that may affect the treatment at the IWWTF. In the event that pre-discharge monitoring/testing indicates that treated effluent quality does not meet *Environment Act* License conditions, R3 Innovations Inc. will temporarily divert the effluent to the former IWWTF cells located to the east of the existing IWWTF (as is current practice). This water will be tested for compliance with *Environment Act* License conditions and will be either discharged to the Whitemud River (if license requirements are met), bled back into the IWWTF for additional treatment or transferred to the Town of Neepawa Municipal Lagoon for additional treatment. In any case where treatment limits are not met and these contingencies must be enacted, Manitoba Conservation and Water Stewardship will be notified.

2.6.2.2 Sludge Management

Sludge from the first and second stage DAFs as well as the WAS will continue to be dewatered on-site in the existing centrifuges. Dewatered sludge will continue to be managed by BFI Canada Ltd. at their facility near Winnipeg in the Rural Municipality of Rosser. The proposed increase in wastewater treatment is anticipated to increase dewatered sludge production to 10,000 to 11,500 kg/day. This sludge will continue to be loaded into roll-off type bins with an anticipated four loads (eight bins) of sludge removed per week. BFI Canada Ltd. has indicated to R3 Innovations Inc. that sufficient capacity exists at their facility to handle the increase in sludge production at the IWWTF.

2.6.2.3 Other Wastes

The screening process will remove materials such as sanitary wastes, straw and other small particles. Solids that are removed during the screening process will continue to be transferred to a load-off bin located in the screening/pumping building. Approximately 578 kg of screenings are anticipated to be generated on a daily basis. Screenings will continue to be sent to a landfill for final disposal. Evergreen Environmental Technologies has indicated to R3 Innovations Inc. that sufficient capacity exists at their facility to handle the increase in screenings from the IWWTF. Approximately three trucks a week will transport screenings to the landfill.

General garbage is divided into two categories: domestic waste and recyclable waste. Domestic waste will continue to be disposed of at Evergreen Environmental Technologies. It is expected that approximately 45 kg/week of domestic solid waste will be generated at the facility which will require approximately 1 truck per week to transport the domestic waste to the landfill. This waste will be transported with the screenings to the landfill. A minimal amount of glass and paper will be generated by the employees which will likely be recycled under the Town of Neepawa's existing recycling program.

2.7 Traffic Summary

HyLife Foods pork processing facility proposes to increase their pork processing from 27,550 hogs/week to 37,500 hogs/week which will increase the amount of traffic travelling to and from the project site including the IWWTF. **Table 10** summarizes the current traffic flow at the site and the proposed increase related to the proposed alterations.

Table 10. Traffic Summary

Materials	Current Condition (27,550 hogs/week)	Proposed Condition (37,500 hogs/week)
HYLIFE FOODS		
Hogs	24 trucks/day	33 trucks/day
Packaging	15 trucks/week	20 trucks/week
Chemical (citrate and cleaning)	2 trucks/week	2 trucks/week
Final Product	120 trucks/week	163 trucks/week
Domestic Waste	1 truck every 2 days (estimated)	1 truck every 1 to 2 days (estimated)
Hair and Toenails	2 truck/day	2 trucks/day
Bedding Material	3-5 trucks/week (summer) 10-15 trucks/week (winter)	4-7 trucks/week (summer) 13-21 trucks/week (winter)
Renderable Material	15 trucks/week	15 trucks/week
Blood	3 trucks/week	4 trucks/week
Processed Casings & Heparin	1 truck/day (hash guts)	½ truck/week
IWWTF		
BFI Sludge Roll-off Bins	3 trucks/week	4 trucks/week
Screenings/Domestic Waste	2 trucks/week	3 trucks/week
Average Daily Total *	65 trucks/day	85 trucks/day

Note:
** Assumed a five day operation.*

HyLife Foods reports that significant carpooling occurs with the present employees. There may be up to 950 vehicles/day travelling to the site, however, due to the significant carpooling, this number can by significantly lower. With the proposed increase in pork processing, the amount of vehicles travelling to the site may be up to 1,250 vehicles/day, however**,** it is anticipated that this number will be lower due to continued carpooling. According to HyLife Foods, there is enough parking availability at the pork processing facility to accommodate the increase.

Currently, HyLife Foods produces hash guts and approximately 1 truck/day travels from the site with this product. With the proposed addition of a casings and heparin operation, this will in turn decrease the amount of trucks traveling from the site to ½ truck load per week.

The average daily total traffic, based on a five day operation, is conservatively estimated at 65 trucks/day travelling to/from the HyLife Foods facility and IWWTF site. With the proposed alterations, the average daily traffic is estimated to increase by approximately 24% to approximately 85 trucks/day.

2.8 Schedule

The start of the construction phase is dependent on approval by Manitoba Conservation and Water Stewardship, which is anticipated by July 2013. Depending on the date of approval, the cut floor expansion at the HyLife Foods pork processing facility is anticipated to begin in September 2013 (approximately nine months of construction). This will be followed by the construction of the casings/heparin line (approximately nine months of construction) and the employee welfare area (approximately six months of construction) that are anticipated to begin in the spring of 2014 Construction at the IWWTF is anticipated to begin in the spring of 2014 with an approximate construction schedule of nine months.

2.9 Funding

Funding for the project will be provided by HyLife Foods LP.

3. Existing Environment

The HyLife Foods and IWWTF site (Project Site) is located at the eastern boundary of the Town of Neepawa, approximately 2.4 km east of the intersection of Provincial Highway No. 16 and Provincial Highway No. 5 in the western portion of SW 35-14-15 W.P.M. The land owned by HyLife Foods occupies an area of 121.35 acres, the land owned by R3 Innovations Inc. occupies an area of 5.65 acres, whereas the land owned by the Town of Neepawa occupies an area of 33.04 acres (approximately). The closest surface water body, excluding treatment ponds and drainage ditches, is the Whitemud River, located approximately 1,000 m northwest of the Project Site.

On a larger scale, the Project Site is located approximately 144 km east of the Manitoba-Saskatchewan border, approximately 305 km west of the Manitoba-Ontario border, approximately 137 km north from the Canada-United States of America border, and approximately 59 km west of Lake Manitoba. The nearest cities and towns along with their approximate distance from the Town of Neepawa include: the Town of Gladstone (37 km east), the Town of Minnedosa (30 km west), the Town of Carberry (47 km south), the City of Brandon (76 km southwest), and the City of Winnipeg (188 km southeast) (Google Inc., 2013). The closest First Nation Community is the Rolling River First Nation, located approximately 46 km northwest of the Project Site (Google Inc., 2013).

3.1 Study Area

The regional study area includes all areas within a 10 km radius of the Project Site centre as shown in **Figure 7**. A greater detail of study has been conducted within a 3 km radius of the Project Site (**Figure 8**) where effects of the proposed development may potentially be more prominent. The 3 km study area includes the Town of Neepawa and the northern portion of the R.M. of Langford, the southern portion of the R.M. of Rosedale and the south-western portion of the R.M. of Lansdowne. The 10 km radius boundary extends approximately to the intersection of Provincial Highway No. 16 and Provincial Road No. 464 to the west, approximately 1.1 km south of the community of Hallboro to the south, approximately 2.9 km to the west of the intersection of Provincial Highway No. 16 and Provincial Road No. 352 to the east and approximately 1 km to the south of the intersection of Provincial Highway No. 5 and Provincial Road No. 471 to the north. The 3 km radius area extends approximately 3.6 km to the north of Provincial Highway No. 16, approximately 2.7 km to the east of the eastern Town of Neepawa limits, approximately 2.5 km south of Provincial Highway No. 16 and to the west to approximately the intersection of First Avenue and Mill Street in the Town of Neepawa.

3.2 Topography

Topography in the Neepawa area varies from a nearly level to gently rolling pattern, with a general decrease in elevation towards the Whitemud River. The Project Site generally ranges in elevation from 360 meters above sea level (masl) to 370 masl (Department of Energy, Mines and Resources, 1997). Specifically, the elevation at the IWWTF site ranges from 358 masl in the northern portion to 366 masl in the southern portion (Michalyna et al., 1976).

3.3 Geological Background

According to Ehrlich et al., the Carberry area (including the Town of Neepawa) is underlain by shales, sandstones and evaporates with bedrock formations from the Cretaceous and Jurassic periods (1957). According to Michalyna et al., the Neepawa area is underlain by rocks and sediments of the Vermilion formation, the Favel formation and the Ashville formation (1976). These three formations contain shale, limestone, bentonite, and minor amounts of sand and silt. According to the bedrock surface topography map prepared by the Province of Manitoba, Department of

Natural Resources, Water Resources Branch, bedrock surface elevation in the vicinity of the Town of Neepawa is approximately 330 masl. (Province of Manitoba, 1988).

Surface materials are quite varied in the region due to glacial action followed by deposition. The surface materials in the vicinity of the site are described by Michalyna et al. as medium to moderately fine lacustrine and moderately coarse to coarse lacustrine surface deposits (1976).

3.4 Soils

3.4.1 Soils of the Brandon Region

The soils of the Brandon Region including a small area around the Town of Neepawa have been surveyed on a detailed level (scale 1:20,000).

Based on the detailed soil survey of the Neepawa area, the soils at the Project Site, consist of the Stockton series, Sewell series, Lavenham series, Hummerston series, Vordas series, Torcan series, and Taggart series as shown on **Figure 9** (Michalyna et al., 1976). Descriptions of the soil series present in the vicinity of the site are included in the following sections.

Stockton Series

The Stockton series soil texture is considered to be a loamy fine sand. Its topography is very gently sloping to irregular undulating with moderate runoff. These soils are considered moderately to well drained and may be subject to wind erosion if not properly managed. The Stockton series was developed on weakly to moderately calcareous sandy textured lacustrine and deltaic deposits.

Sewell Series

The Sewell series soils have a loamy fine sand texture. These soils were developed on weakly to moderately calcareous sandy textured lacustrine and deltaic deposits. The topography is level to depressional. Permeability is rapid when free water is more than 0.7 m below the ground surface, however it is restricted when free water is at or near the ground surface.

Lavenham Series

The Lavenham soil series includes soils of a loamy fine sand texture and are generally level to very gently sloping. Soil permeability is considered moderately rapid but may be restricted when the water table is high. These soils have developed on weakly to moderately calcareous sandy textured lacustrine and deltaic deposits and are susceptible to erosion.

Hummerston Series

The Hummerston soils have a variable soil texture consisting of loamy fine sand with local areas of very fine sand or loamy very fine sand. These soils have developed on weakly to moderately calcareous sandy textured lacustrine and deltaic deposits. The topography is level to irregular and gently undulating. Permeability is considered moderately rapid however it is impeded when the water table is high in the spring and early summer.

Vordas Series

The Vordas series soils have a silt loam texture. They developed on strongly to very strongly calcareous loamy lacustrine sediments and have topography that is level to depressional. Soil permeability is moderate but may be restricted when free water occurs within a meter of the ground surface.

Torcan Series

The soil texture of the Torcan series is considered silty loam. These soils were developed on strongly to very strongly calcareous loamy lacustrine sediments and occur on very gently sloping or intermediate to lower slope positions of undulating topography. Soil permeability is moderate but may be restricted when free water occurs within a meter of the ground surface.

Taggart Series

The soil texture of the Taggart series is considered silty loam. These soils were developed on strongly to very strongly calcareous, loamy lacustrine sediments. Topography of the Taggart series is considered level to very gently sloping. Permeability is moderate however it may be restricted when free water occurs within a meter of the ground surface.

3.4.2 Soils at the Former IWWTF Site

A detailed geotechnical investigation at the former IWWTF site was undertaken by UMA Engineering Ltd. in February, 1986. The investigation included drilling and sampling of 22 test holes and installation of three standpipe piezometers. Falling head permeability tests were conducted to determine the in-situ permeabilities at the three piezometer locations. A constant head test was also completed in the laboratory to determine soil permeability. According to the geotechnical report, the former IWWTF site is located on a flat plain flanked on the east and west boundaries by topographical depressions. The ground surface slopes to the north at a grade of approximately 1%. (EarthTech, 2008)

According to the UMA Engineering Ltd. report, the soil profile consisted of topsoil approximately 0.3 m thick, underlain by brown sand that extends approximately 6 m below the ground surface, overlying grey sand. The topsoil was black, silty and organic. The underlying brown sand was fine to medium with subangular particles and was of medium density. The sand was moist at the surface and was wet approximately 3.0 m to 4.0 m below the ground surface. The brown sand was underlain by grey sand which was wet, fine and silty. The fine sand became a sandy silt with depth. The field falling head tests found that the average permeability of the grey sand was 1.5×10^{-4} cm/s. The laboratory constant head test produced a permeability value of 3.4×10^{-4} cm/s. The groundwater elevations were measured in the three installed piezometers which indicated an apparent flow in a northerly direction. (Earth Tech, 2008)

A geotechnical investigation was completed as part of the 2008 Request for Alteration to the Town of Neepawa's Industrial Wastewater Treatment Facility (the 2008 assessment) which included the installation of five test holes in the location of the current IWWTF. The soil profile encountered during the investigation consisted of a very fine uniformly graded sand deposit with little or no fines (silt and clay) in approximately the upper 2 m. The silt and clay fraction was less than 10 percent. The sand contained 40-60 percent silt and clay sizes below this depth. Sand was encountered in all boreholes to a maximum depth of 6.1 m. The sand was wet to saturated at depths ranging from 1.8 to 2.4 m below the ground surface. (EarthTech, 2008)

3.4.3 Soil Capability for Agriculture

According to the Canada Land Inventory (CLI), mineral soils are grouped into seven classes according to soil survey information. Classes 1, 2 and 3 are considered to be suitable for sustained production of field crops; Class 4 is considered to be marginal; Classes 5 and 6 are considered useable but not generally suitable for crop production. According to the CLI, the Project Site and surrounding area is classified as Class 4. (Canada Land Inventory, 2012a)

3.5 Hydrology

The Whitemud River has a total drainage basin area of approximately 7,400 km² (AAFC-PFRA, 2004) and is partially regulated by the Lake Irwin Dam on Boggy Creek, just upstream of the Town of Neepawa, at which point the upstream drainage area is approximately 830 km². Between the Lake Irwin Dam and the effluent outfall for the Town of Neepawa IWWTF, Boggy Creek becomes the Whitemud River at its confluence with Stony Creek, which adds drainage from approximately 330 km² along the southwest edge of Riding Mountain, west and northwest of the Town of Neepawa.

Similar to all north-temperate prairie rivers, the Whitemud River undergoes wide seasonal fluctuations in discharge associated with frozen conditions in the winter and the annual spring melt, but a relatively consistent base flow is maintained in the river through operation of the Lake Irwin Dam. Further augmentation of base flows is provided by groundwater discharge in headwater tributaries, particularly along the slope of Riding Mountain (including the upper reaches of Stony Creek) and, downstream of the Town of Neepawa, in creeks receiving discharge from the Assiniboine Delta Aquifer (particularly Pine Creek). These discharges and releases from the Lake Irwin Dam ensure that some flow is maintained at all times in the river downstream of the Town of Neepawa. The river's deeply incised channel and numerous small weirs throughout its run (including anthropogenic weirs, ford crossings, and beaver dams) tend to moderate water levels in the river during periods of low flow and prevent drying of the channel.

As discussed in the 2008 assessment, the current operation of the Lake Irwin Dam (on Boggy Creek, just upstream of the Town of Neepawa) is based on a fixed release of 0.2 m³/s, with additional flows occurring over a fixed spillway structure when water levels are high in the lake (Buermeyer pers. comm., 2007; Laychuk pers. comm., 2008). Based on estimates derived from a flow relationship described in the 2008 assessment, typical (median) mean monthly flows in the Whitemud River in the Town of Neepawa (downstream of the confluence with Stony Creek) are approximately 5.9 m³/s, 1.4 m³/s, and 0.56 m³/s in April, May and June, respectively, declining to near the base flow for the remainder of the year.

As discussed in the 2008 assessment, 0.2 m³/s appears to represent a fairly consistent base flow in the river at the Town of Neepawa from July through March in most years. However, during the period of the historical dataset (1961-1992), late-summer flows were frequently below 0.15 m³/s, and dropped below 0.1 m³/s approximately 10% of the time. For the purposes of the 2008 assessment, it was assumed that 0.2 m³/s in the Whitemud River at the Town of Neepawa was both the typical flow for the July-March period and the minimum flow in all months of the year.

Downstream of the Town of Neepawa, inflows to the Whitemud River occur throughout its run during periods of surface runoff, but incremental increases in flow during dry periods appear to be restricted to the reach of the river downstream of the Town of Gladstone, likely due to base flows in tributaries such as Big Grass Marsh Drain, Pine Creek, and Rat Creek.

3.6 Surface Water Quality

A number of locations in the Whitemud River watershed have been used for water quality sampling by the Province of Manitoba since 1990. However, sampling at upstream stations near Neepawa (MB05LLS010 and MB05LLS011) was discontinued after April 1992, and three stations between the Town of Neepawa and the Town of Gladstone (MB05LLS003, MB05LLS004 and MB05LLS044) were last sampled in 1998, following a three-year watershed study (Hughes, 1999). Since 2002, water quality monitoring has been conducted only at Stations MB05LLS005 on Boggy Creek between Lake Irwin and the Town of Neepawa and MB05LLS001 at the community of Westbourne, near Lake Manitoba. The locations of the various sampling stations are shown in **Figure 10**.

A surface water quality assessment was completed as part of the 2008 assessment. The assessment was based primarily upon interpretation of datasets provided by Manitoba Conservation (now Manitoba Conservation and Water Stewardship) for the Whitemud River and its tributaries (up to 2006), and particularly on five monitoring stations between the Town of Neepawa and the Town of Gladstone from 1990-1992 (MB05LLS001, MB05LLS003, MB05LLS004, MB05LLS010, and MB05LLS011).

As reported in the 2008 surface water quality assessment;

- Despite agricultural, municipal and industrial influences in the Whitemud River watershed, concentrations of anthropogenic contaminants were generally low. Potentially toxic metals in the river were found to be below Manitoba Water Quality Standards, Objectives, and Guidelines (MWQSOGs) values in all samples collected except for copper and iron, which occasionally exceeded Objective and Guideline values both upstream and downstream of the Town of Neepawa. It was noted that these metals likely originate naturally in the local soils. Total dissolved solids concentrations frequently exceeded the Guideline for irrigation downstream of the Town of Neepawa, and were likely reflective of a combination of the local soils, effluents to the river and intrusion of naturally occurring saline groundwater between the Town of Neepawa and the community of Westbourne.

- Concentrations of organic chemicals, such as phenols, herbicides and pesticides, in the Whitemud River were found to be below MWQSOGs with a few exceptions; it was noted that the identified occasional exceedances would not be expected to limit the suitability of the Whitemud River as an aquatic habitat.

- Fecal coliform bacteria was identified as being abnormally high in Stony Creek just upstream of the Town of Neepawa, according to the three-year watershed study (Hughes, 1999). Fecal coliform bacteria in the rest of the Whitemud River and tributaries examined in the 1996-1998 watershed study were, in most samples collected, below the Manitoba Water Quality Objective for recreational waters.

- Dissolved oxygen (DO) in the Whitemud River is generally below saturation, and concentrations below the MWQSOGs for protection of cool-water aquatic life were recorded at each monitoring station on the river during ice-covered and open-water seasons. Sub-saturation of oxygen in the river is, in large part, due to degradation of organic matter, as organic carbon and biochemical oxygen demand (COD and BOD) concentrations are substantial in the river.

- Although impacts to riparian vegetation have occurred in numerous areas, the river's narrow, defined channel and treed banks and riparian zones provide substantial shade to much of the river downstream of the Town of Neepawa. This shade appears to be sufficient to moderate water temperatures in the river during the summer, which helps to protect the river's habitat suitability for cool-water fish such as walleye and enhances oxygenation of the water.

- Reported ammonia exceedances, and a general trend of elevated ammonia concentrations in the reach of the river downstream of the Town of Neepawa, likely reflected the discharge of ammonia-rich effluent from the IWWTF, which has been mitigated to some extent since 2001 by routing of the effluent through the Town of Neepawa's municipal lagoon system, and was expected to be corrected further by the proposed upgrades to the IWWTF. Ammonia exists naturally in surface waters as an excreted waste and degradation product of plant and animal tissues. It is consumed as a nutrient by plants and algae, which generally results in higher concentrations during winter than during the summer growing season, which was the pattern seen in the data from all monitoring stations on the Whitemud River.

- An increase in nutrients (ammonia, nitrate and phosphorus) was reported at the Town of Neepawa, followed by significant reductions in concentrations along the river further downstream during the growing season, suggestive of uptake by aquatic plants and algae.

- Total phosphorus concentrations exceeded the narrative Manitoba Water Quality Guideline of 0.05 mg/L in most samples collected from the Whitemud River between 1990 and 1992. However, concentrations were lower than in many prairie rivers with anthropogenic influences, particularly at Station MB05LLS011 upstream of the Town of Neepawa, where concentrations approached the Guideline in several samples collected in each season. Similar to ammonia and nitrate, phosphorus concentrations during the growing season typically declined downstream of inputs at the Town of Neepawa. However, whereas the nitrogenous compounds generally declined to growth-limiting concentrations at or downstream of the Town of Gladstone, phosphorus often approached, but rarely reached, limiting concentrations. The data at the time of the 2008 assessment suggested that, in reaches downstream of nutrient inputs at the Town of Neepawa, nitrogen limitation may occur in the Whitemud River, and that, if phosphorus loadings were reduced, plant and algae growth could become co-limited by both nutrients.

Since the 2008 assessment, water quality data from 2007 to 2012 has been provided by Manitoba Conservation and Water Stewardship for the upstream Station MB05LLS005 on Boggy Creek between Lake Irwin and the Town of Neepawa, and the downstream Station MB05LLS001 at the community of Westbourne near Lake Manitoba located approximately 142 km downstream from the IWWTF outfall. The only station that overlaps with the 1990-1992 data used for the 2008 surface water quality assessment is the downstream Station MB05LLS001. A discussion on the Whitemud River water quality based on the new data for parameters related to wastewater treatment is provided in the following paragraphs.

Total Kjeldahl nitrogen (TKN) concentrations for 2007 to 2012 ranged from 0.9 to 2.69 mg/L at the upstream station and from 0.8 to 2.4 mg/L at the downstream station. Minimum, maximum and median concentrations recorded at the downstream station MB05LLS001 in 2007 to 2012 have increased compared to the 2008 assessment (1990-1992). Dissolved nitrogen (NO_3 & NO_2) concentrations for 2007 to 2012 ranged from 0.02 to 7.62 mg/L at the upstream station and from 0.01 to 2.34 mg/L at the downstream station. Minimum, maximum and median concentrations recorded at downstream station MB05LLS001 have increased compared to the 1990-1992 data presented in the 2008 assessment. In general, TKN and dissolved nitrogen (NO_3 & NO_2) concentrations recorded during 2007 to 2012 appear to have increased compared to the 1990-1992 water quality data set presented in the 2008 assessment. The downstream station recorded lower minimum, maximum, and median values compared to the upstream location during 2007 to 2012.

Consistent with the 2008 water quality assessment data (1990-1992), total phosphorus concentrations exceeded the narrative MWQSOG Guideline of 0.05 mg/L in most samples collected from 2007 to 2012. Concentrations ranged from 0.04 to 0.66 mg/L at the upstream station and from 0.04 to 0.63 mg/L at the downstream station. Minimum, maximum and median concentrations recorded at the downstream station MB05LLS001 during 2007 to 2012 are

similar to the 1990 to 1992 data. Generally, minimum, maximum, and median concentrations appear to be slightly higher at the upstream station between 2007 and 2012 when compared to the 1990 to 1992 data.

BOD concentrations ranged from 1.1 to 5.6 mg/L at the upstream station and 1.0 to 6.9 mg/L at the downstream station. Minimum, maximum and median concentrations recorded at downstream station MB05LLS001 have increased compared to the 1990-1992 data presented in the 2008 assessment. In general, minimum, maximum, and median concentrations are similar in the downstream and upstream stations between 2007 and 2012.

There was only one recorded E.coli exceedance of the MWQSOG Objective of 200 CFU/100 mL in the 2007 to 2012 data set. Concentrations ranged from 10 to 120 CFU/100 mL at the upstream station and from 10 to 240 CFU/100 mL at the downstream station. In general, minimum, maximum, and median concentrations are similar in the downstream and upstream stations between 2007 and 2012, with the exception of the one recorded exceedance.

At the upstream station, TSS concentrations ranged from 1 to 180 mg/L while the downstream station ranged from 3 to 238 mg/L. Generally, TSS concentrations appear to be lower at the upstream station compared to the downstream station.

3.7 Hydrogeology

According to the Province of Manitoba, Department of Natural Resources, Water Resources Branch Bedrock Aquifer map, there are no bedrock aquifers at depths of less than 150 m below the ground surface within the Project Area. According to the same source, the Sand and Gravel Aquifer map indicates that, in the Project Area, there are sand and gravel aquifers present which can be described as thin unconfined sand aquifers which will yield less than 0.5 L/s (1988).

According to the Groundwater Availability Study of the Neepawa Area, the study area falls in the minor overburden aquifer areas with overburden thickness of approximately 50 m. The potentiometric surface elevation in the study area is approximately 360 masl and groundwater flow direction is generally in an easterly direction towards Lake Manitoba (Province of Manitoba, 1988). As indicated in the 2008 assessment, the local groundwater flows in a northerly direction.

The surface deposits in the Neepawa area are of a shallow surface sand hydrogeological unit. The sand forms a thin and extensive shallow sand aquifer. Underlying the sand is a thick clay with sand and gravel aquifers interbedded in the till underlying the clay. The sand and gravel aquifers underlying the clay are generally not potable. Therefore the thin shallow sand aquifer is generally the only source of potable groundwater in the area. The shallow sand aquifers recharge by precipitation with the majority of the recharge occurring during the spring snow melt and rains. The groundwater quality is good to excellent in the shallow sand aquifers and in general the groundwater supply is abundant (Manitoba Conservation, 1985).

According to the Province of Manitoba's groundwater pollution hazard map, the Project Site falls within a designated groundwater pollution hazard area, as shown in **Figure 11** and, as such, is sensitive to groundwater contamination (Province of Manitoba, 1978).

Groundwater monitoring conducted near the former IWWTF site in 2007 indicated limited impacts to the shallow groundwater in the vicinity of some of the former IWWTF treatment cells. The Town of Neepawa has reported the findings of the study to Manitoba Conservation and Water Stewardship. Communication between HyLife Foods and Manitoba Conservation and Water Stewardship (on May 13, 2010) has indicated that as the treatment components are for the most part above ground and as the existing earthen ponds are to be decommissioned, no further groundwater monitoring is required.

3.7.1 Extent of Groundwater Use

A review of Manitoba Water Stewardship's water well database 2007 (GWdrill) was completed as part of the 2008 assessment. It was estimated that there were 115 registered wells that existed within a 3 km radius of the Project Site, including four registered wells with unknown exact locations. According to the well records, of the 115 registered wells, 81 were registered as production wells, 26 were registered as test wells and eight were registered as observation wells. Within a 1.5 km radius of the Project Site there were 53 registered wells according to the same source. The well records indicated that of the 53 registered wells, 33 were registered as production wells, 12 were registered as test wells and eight were registered as observation wells.

A review of the GWdrill water well database for 2012 was completed and six additional registered wells were found to be within a 3 km radius of the Project Site. According to the well records, the six wells are registered as production wells. A summary of the water use for the production wells within a 3 km and 1.5 km radius of the Project Site is indicated in **Table 11**.

Table 11. Number of Registered Production Wells by Use Within 3 km and 1.5 km of the Project Site

Distance to Project Site	Domestic	Livestock	Domestic & Livestock	Municipal	Other	No water use listed	Total
3.0 km [1]	47	13	24	1	2	0	83
1.5 km	14	8	10	0	1	0	33

Notes:
Data obtained from EarthTech (2008) and Manitoba Water Stewardship, Groundwater Management Section (2012).
1. Includes wells within 1.5 km of the Project Site.

As indicated in **Table 11**, the majority of the production wells in the 3 km area are intended for domestic water use. The depth from the ground surface to the perforated well section in which groundwater can enter the wells within the 1.5 km radius of the Project Site ranged from 1.8 to 34.7 m below the ground surface. The shallowest well within the 1.5 km radius had a bottom depth of 5.8 m below the ground surface.

Based on the review of Manitoba Water Stewardship's Water Branch 2007 and 2012 well records, the closest wells to the Project Site are located in the southwest quadrant of 35-14-15W as shown in **Figure 12**. There are eight registered wells in the southwest quadrant of 35-14-15W all of which are designated as observation wells and are registered to MWSB Hog Plant which is the HyLife Foods pork processing facility. According to the well logs, the soils in the vicinity of the observation wells consist of brown sand extending to approximately 5.5 m below the ground surface. In some of the observation wells, a clay layer was encountered in the sand with a thickness ranging from 0.2 to 1.2 m. The thickness and presence of the clay layer was not consistent in the observation wells. Below the clay layer, sand was encountered which was underlain in some of the boreholes by silt or silt and clay at a depth of approximately 8.5 m below the ground surface. In the observation wells, groundwater was encountered at depths ranging from 0.9 to 4.3 m below the ground surface.

3.8 Ambient Air Quality

No ambient air quality data for the Project Site exists, as there is no continuous air quality monitoring at the project location. However, Manitoba Conservation and Water Stewardship has monitoring stations located within the City of Winnipeg, the City of Brandon, the City of Flin Flon, and the City of Thompson. In this case, the City of Brandon

station, located at Assiniboine Community College, was chosen as the most representative of the Project Site as it was geographically closest and can provide a general indication of air quality in the general region.

Air quality data for the City of Brandon from 1995 to 2011 was obtained from Manitoba Conservation and Water Stewardship. The data included the following parameters; Ammonia (NH_3), Nitric Oxide (NO), Nitrogen Dioxide (NO_2), Nitrogen Oxides (NO_X), Oxidants Ozone (O_3), and Inhalable Particulate (PM_{10} and $PM_{2.5}$). **Table 12** provides a general summary of the average annual air quality data based on the data provided by Manitoba Conservation and Water Stewardship.

Table 12. Estimated Ambient Air Quality for the Brandon Area

Name of Pollutant	Data Source	Units of Measurement	Averaging Period	Average Annual Parameter Concentration	Maximum Acceptable Level Concentration [1]
NH_3	Brandon Assiniboine Community College	ppm	1995-2011	0.02	2.0
TSP	Brandon 1104 Princess Avenue	µg/m^3	1995-1999	37	NA
PM_{10}	Brandon Assiniboine Community College	µg/m^3	1997-2011	21.4	50
$PM_{2.5}$	Brandon Assiniboine Community College	µg/m^3	2001-2011	5.1	30
NO_2	Brandon Assiniboine Community College	pphm	1995-2011 (excluding 1996)	0.62	5.3
O_3	Brandon Assiniboine Community College	pphm	1995-2011	2.63	1.5

Notes:
Data obtained from Manitoba Conservation, Air Quality Section – Annual Air Quality Statistics, 2012 (accessed).
1 Manitoba Ambient Air Quality Criteria (July 2005).

As there is no ambient air quality data for the Project Site, the City of Brandon station located at Assiniboine Community College was selected as being the most representative of the Project Site. The average annual air quality concentrations in **Table 12** are all below the Manitoba Ambient Air Quality Criteria (AAQC) with the exception of ozone. The elevated concentration of ozone is likely due to emissions from vehicles, industrial processes, etc.

3.9 Climate

The Neepawa area is described as experiencing a continental climate. It receives 516.3 mm of precipitation per year, with 405.7 mm as rainfall and 110.7 mm as snow (Environment Canada, 2012a). The Neepawa meteorological station measures temperature and precipitation while the closest meteorological station that measures wind speed and direction is the Brandon station. **Table 13** shows the monthly temperature and precipitation for the Neepawa station and the monthly wind speed and direction for the Brandon station over the normal period. **Table 14** shows other relevant weather parameters for the Town of Neepawa.

Table 13. Climate Data for Neepawa, Manitoba (1971-2000)
Latitude 50º 13' N Longitude 99º 28' W Elevation 358.10 m
And Brandon, Manitoba (1971-2000)
Latitude 49º 54' N Longitude 99º 57' W Elevation 409.40 m

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	Code
Daily Average Temperature (°C)[1]	-17.1	-13.1	-6.1	3.4	11.5	16.5	18.9	17.9	11.9	5.2	-5.2	-14.1	2.5	A
Precipitation (mm) [1]	20.1	14.6	24.4	35	58.4	79.5	82	70.4	57.9	31.3	20.8	22	516.3	A
Average Wind Speed (km/h)[2]	15.6	15.2	15.5	16.5	16.8	15.3	12.8	13.1	15.1	15.6	14.9	15.5	15.2	A
Most Frequent Wind Direction[2]	W	W	W	NE	NE	W	W	W	W	W	W	W	W	A

Notes:
Data obtained from Environment Canada, Neepawa meteorological station (2012a) and Brandon A meteorological station (2012b).
"A": World Meteorological Organization (WMO) "3 and 5 rule" (i.e. no more than 3 consecutive and no more than 5 total missing for either temperature or precipitation) between 1971 and 2000.
1. Neepawa meteorological station.
2. Brandon A meteorological station.

Table 14. Other Weather Parameters for Neepawa, Manitoba

Parameter	Value
Extreme Maximum Temperature (°C)	37.5 (August 6, 1988)
Extreme Minimum Temperature (°C)	-42.5 (February 1, 1996)
Extreme Daily Rainfall (mm)	140.2 (July 30, 1987)
Extreme Daily Snowfall (cm)	33 (April. 19, 1992)

Note:
Data obtained from Environment Canada Neepawa meteorological station (2012).

3.10 Vegetation and Wildlife

3.10.1 Natural Vegetation

The Project Region is located in the Shilo Ecodistrict which is part of the Aspen Parkland Ecoregion and part of the larger Prairies Ecozone. Much of the native vegetation in this ecozone has been altered to agricultural crop land and rangelands in drier areas. The natural grasslands typically consist of spear grass, wheat grass and blue grama grass. Alkali grass, wild foxtail barley, red samphire and sea blite are found in more saline areas. (Smith *et al*, 1998)

Vegetation in the Aspen Parkland Ecoregion is considered to be a transition between the boreal forests in the north and the grasslands to the south. The natural vegetation varies in the Shilo Ecodistrict from loamy areas that typically consist of trembling aspen groves in more moist locations to various types of grasslands on drier landscapes. Along larger waterways, maple and ash can be found. (Smith *et al*, 1998)

The Project Area is located within the aspen-oak forest of the Boreal Forest Region. This area is characterized by groves of trees, interspersed with grasslands. The dominant tree species is aspen, while balsam poplar is common in wet areas and bur oak will sporadically occur along rivers. Other common species include white elm, Manitoba maple, eastern cottonwood, and possibly basswood and black ash. (Rowe, 1972) According to the CLI, the capability for forestry in the Project Area, including the Project Site is rated as having severe limitations to the production of forestry (Class 5 and 6). One area west of the Project Site is rated as an unclassified area – unmapped area (Class 8). (Canada Land Inventory, 2012b).

A terrestrial survey was completed in the area of the current IWWTF as part of the 2008 assessment. The IWWTF area consisted of a hay meadow composed primarily of alfalfa (Medicago sativa) and species of blue grass (Poa spp.). The IWWTF area also included a sand ridge running roughly north-south located along the eastern extremity of the Project Area that is suspected to have formed over a former fence line. The area also included a clump of plants, known locally as “bush”, growing in the middle of the hayfield. The IWWTF site included two dominant willow species, the beaked willow (Salix bebbiana) and pussy willow (Salix discolor). None of the plant species observed within the Project Site were considered “rare or endangered” on a Provincial or Federal level. (EarthTech, 2008)

In the area of the IWWTF outfall, there was a small shallow oxbow meandering through the low area adjacent to the east side of the Whitemud River. At the time of the 2008 site assessment, the oxbow contained very little water but was bordered by an extensive tract of sedges which gradually gave way to native grasses as the elevation increased. The oxbow, at its lowest elevation, had dense stands of cattail in it, while the native grasses were interspersed with shrubs and some trees on the slopes. Species of willows were found to be located in the general vicinity of the outfall along the Whitemud River along with bur oak, balsam poplar, Manitoba maple, white birch and some young aspen poplar and pine trees amongst other species. (EarthTech, 2008)

AECOM completed a site visit on December 6, 2012. At the time of the site visit, the proposed expansion areas of the Project Site were partially snow covered which limited the extent to which vegetation condition observations could be made. However, both areas have been previously disturbed and are either covered by gravel or are grassed. At the IWWTF, there are some grassed areas that may be disturbed during the installation of the aeration tank. Some planted trees that form a wind row located west of the proposed aeration tank may also be disturbed. None of the areas to be disturbed are considered natural.

3.10.2 Wildlife

In the Aspen Parkland Ecoregion, white-tailed deer are widespread and can be found in areas that provide both grazing and cover habitat. Other species that may be found in the ecoregion include coyote, red fox, ground squirrel, cottontail rabbit, hare, striped skunk, redback vole and deer mice. (Smith *et al*, 1998)

There are also many bird species found in the ecoregion including ferriguous hawk, sparrow hawk and red-tailed hawk. Other birds that may be found in the ecoregion include mourning dove, black-billed magpie, red-winged blackbird, killdeer, meadowlark and various species of ducks. (Smith *et al*, 1998)

The capability for ungulates in the Project Area is rated from having very slight limitations to moderately severe limitations to the production of ungulates (Class 2, 3, 4, and 5). The Project Site itself is rated as having very slight limitations to the production of ungulates (Class 2). (Canada Land Inventory, 2012c).

The capability for waterfowl in the Project Area is rated from having moderately severe limitations to the production of waterfowl to such severe limitations that almost no waterfowl are produced (Class 5, 6 and 7). The Project Site itself is rated as having such severe limitations that almost no waterfowl are produced (Class 7). (Canada Land Inventory, 2012d).

A terrestrial survey was completed at the site of the former IWWTF and lands to the immediate north, south, east and west by Green Spaces Environmental Consulting on April 22 and 23, 2008 as part of the 2008 assessment. A specific site visit was also conducted on June 14, 2008 at the current IWWTF site. A total of 31 bird species were recorded in the general vicinity of the current IWWTF site. With respect to terrestrial fauna, the existing IWWTF site location contained a number of mounds of earth produced by northern pocket gophers (*Thomomys talpoides*). There was also evidence that American badger (*Taxidea taxus*), white-tailed deer (*Odocoileus virginianus*) and thirteen-lined ground squirrels (*Spermophilus tridecemlineatus*) occupied the site.

According to the 2008 assessment, there were no rare/endangered wildlife species identified at the Project Site.

AECOM completed a site visit on December 6, 2012. At the time of the site visit, the proposed expansion areas of the Project Site were partially snow covered which limited the extent to which wildlife observations could be made. As indicated in **Section 3.10.1**, both expansion areas have been previously disturbed and are covered by either gravel or grass and are not anticipated to provide wildlife habitat.

3.10.3 Protected Areas

The closest protected area to the Project Site is the Whitemud Watershed Wildlife Management Area, located approximately 9 km to the southeast of the Project Site. The Whitemud Watershed Wildlife Management Area includes 13 widely-spaced units that provide important habitat for deer, upland game birds, amphibians and other wildlife. The most northern units are the closest to the Project Site (9 km from the Project Site) and are parcels of land in the Gladstone-McCreary area that provide wildlife habitat including aspen forest, mixed-grass prairie and formerly cultivated areas seeded to grasses or forage. (Manitoba Conservation, 2012)

Within the R.M. of Langford and the R.M. of Lansdowne, there is a Prairie Farm Rehabilitation Administration (P.F.R.A.) Community Pasture located to the southeast of the Town of Neepawa and approximately 9 km southeast of the Project Site. According to the Neepawa and Area Planning District Development Plan, the Community Pasture was established in 1948 and covers an area of approximately 8,798 ha and is used as an off-farm grazing site for local residents in the community. (Community Planning Services Branch, 2006)

3.11 Aquatic Resources

The Whitemud River provides year-round habitat for a number of aquatic species as detailed in the 2008 assessment. Instream vegetation varies spatially and temporally based on season, bottom substrate and flow conditions. During field studies in 2007, the main channel did not develop extensive vegetative cover, but slower moving back eddies and channel margins reached as much as 80% cover from emergent plants.

Fish surveys in 2007 in the Whitemud River near the Town of Neepawa indicated the presence of northern pike, fathead minnows, white suckers and emerald shiners, with numerous other species known or suspected to inhabit the river (Earth Tech 2008). Several fish species in the river are sought after for recreational fishing, which occurs to some extent along the length of the river, although the most concentrated recreational fishing occurs near Lake Manitoba. No subsistence or commercial fishing occurs on the Whitemud River, however approximately 190 km downstream on Lake Manitoba, these activities do occur. The use of habitats as far upstream as the Town of Neepawa by Lake Manitoba fish populations is likely limited by barriers to upstream fish passage along the river.

3.12 Protected Species

To determine the potential species at risk that may occur in the Project Region, the Manitoba Conservation Data Centre, Occurrence of Species by Ecoregion was examined (2013a). The species listed on the Manitoba Conservation Data Centre were cross referenced with Schedule 1 of the *Federal Species at Risk Act* (SARA) and the *Manitoba Endangered Species Act* to determine the provincially listed rare or sensitive species that may occur in the Project Region. The Manitoba Conservation – Wildlife and Ecosystem Protection Branch distribution maps were also used where possible to determine provincially listed species that may occur in the Project Region. The search results found that there is potential for 24 listed species to occur in the general Project Region as shown in the following table.

Table 15. Federally and Provincially Listed Species that May Occur in the Project Region

Species	Federal SARA Species Status	Manitoba Conservation Endangered Species Act Status	Environmental Considerations
Invertebrate Animal			
Pale yellow dune moth *Copablepharon grade*	Special Concern	Endangered	• Found in semi-stable dunes with sparse grass and forb cover. (Note 2)
Dusky dune moth *Copablepharon longipenne*	Special Concern	Endangered	• Found only in sparsely vegetated active sand dunes. (Note 2)
Dakota skipper *Hesperia dacotae*	Threatened	Threatened	• Found in native tall-grass prairies that feature bluestem grasses and plants such as smooth camas, harebell, black-eyed Susan, and wood lily (nectar sources). (Note 2)
Golden-edged gem *Schinia avemensis*	Endangered	Endangered	• Found in areas of active dunes (dunes that are not stabilized by vegetation) in grassland fragments. • Also found in dune blow-outs (a depression created in the sand on the upwind side of a dune). (Note 2)
White flower moth *Schinia bimatris*	Endangered	Endangered	• Found in active sand dunes located in the aspen-parkland region. (Note 2)
Vascular Plant			
Buffalograss *Buchloe dactyloides*	Threatened	Threatened	• Found in shortgrass, mixed-grass prairies and is often found in native pastures. • Found growing in clay to loam soils along gradual slopes of river and creek valleys. (Note 1)
Smooth goosefoot *Chenopodium subglabrum*	Threatened	Endangered	• Found in unstable sand areas on the stabilizing edges of active dunes. • Also found on river sand bars and sandy floodplain terraces. (Note 2)
Small white lady's-slipper *Cypripedium candidum*	Endangered	Endangered	• Found in calcareous prairie opening in wooded grasslands, or on more open, south-facing slopes. • Often found in relatively undisturbed grasslands but can also be found in disturbed areas such as roadside ditches. (Note 1)
Western spiderwort *Tradescantia occidentalis*	Threatened	Threatened	• Only found in sandy soils, on open to partially stabilized dune systems. • Most often found along south-facing slopes and on the crests of slopes. • Prefer areas with sparse vegetation but can grow

Species	Federal SARA Species Status	Manitoba Conservation Endangered Species Act Status	Environmental Considerations
			among sparse shrubs in grazed areas. (Note 1)
Vertebrate Animal			
Sprague's pipit *Anthus spragueii*	Threatened	Threatened	• Prefer native vegetation of intermediate height and density in areas where habitats are lightly to moderately grazed or where fires periodically remove vegetation. (Note 2)
Short-eared owl *Asio flammeus*	Special Concern	Threatened	• Found in a variety of open habitats including arctic tundra, grasslands, peat bogs, marshes, sand-sage concentrations and old pastures. • Occasionally breeds in agricultural fields. • Prefers nesting sites in dense grasslands, as well as tundra with areas of small willows. (Note 2)
Burrowing owl *Athene cunicularia*	Endangered	Endangered	• Found in flat to gently rolling treeless pasture and prairie, especially grasslands containing abandoned burrows suitable for nesting, roosting and caching food. • Pasture lands are the most commonly used habitat in Manitoba but they have also been found nesting in ditches, croplands, golf courses and even manicured lawns. (Note 1)
Great plains toad *Bufo cognatus*	Special Concern	Threatened	• Generally found in dry, open grasslands and breed primarily in temporary wetlands or edges of some permanent or semi-permanent wetlands. • These shallow, clear pools are often found in imperfectly drained, sandy areas in grasslands, pastures, ditches or agricultural fields and range in size from large wetlands to small puddles. (Note 1)
Ferruginous hawk *Buteo regalis*	Threatened	Endangered	• Prefer open areas dominated by native grasses with scattered trees or shrubs with abundant ground squirrels for food. • An isolated tree or elevated structure is typically used for a nest site, but the species occasionally uses a highly built-up nest on the ground. (Note 1)
Chestnut-collared longspur *Calcarius ornatus*	Threatened	Endangered	• Found in native prairie grasslands and typically breeds in recently grazed or mowed, arid, short or mixed-grass prairie. (Note 3)
Chimney swift *Chaetura pelagica*	Threatened	Threatened	• Mainly associated with urban and rural areas where the birds can find chimneys to use as nesting and resting sites. • A small portion of the population is likely to still use hollow trees for nesting. (Note 2)
Piping plover *Charadrius melodus*	Endangered Schedule 1	Threatened	• Nests on gravel shores of shallow, saline lakes and on sandy shores of larger prairie lakes above the high water mark. (Note 2)
Common nighthawk *Chordeiles minor*	Threatened	Threatened	• In Manitoba, found south of the treeline and inhabits mixed and coniferous forests. • Nests in a wide range of open, vegetation-free habitats including dunes, beaches, recently

Species	Federal SARA Species Status	Manitoba Conservation Endangered Species Act Status	Environmental Considerations
			harvested forests, burnt-over areas, logged areas, rocky outcrops, rocky barrens, grasslands, pastures, peat bogs, marshes, lakeshores and river banks. (Note 2)
Olive-sided flycatcher *Contopus cooperi*	Threatened	Not Ranked	• Mostly associated with open ranges with tall live trees or snags for perching including forest clearings, forest edge located near natural openings (ie. Rivers or swamps) or human-made openings (ie. Logged areas), burned forest or openings within old-growth forest stands. • Nests are usually constructed in a conifer when arriving to Canada in mid-May. (Note 2)
Yellow rail *Coturnicops noveboracensis*	Special Concern Schedule 1	Not ranked	• Found in marshes dominated by sedges, true grasses and rushes with little to no standing water. • Also found in damp fields and meadows, on floodplains of rivers and streams. (Note 2)
Loggerhead shrike *Lanius ludovicianus*	Threatened	Endangered	• Found in relatively open, grassy sites; pastured or hayed areas are preferred; often nest in the vicinity of hedgerows or farm shelterbelts. (Note 1)
Silver chub *Macrhybopsis storeriana*	Special Concern Schedule 1	Not Ranked	• In Manitoba, found in large, moderate flowing rivers with a substrate of silt or sand. (Note 2)
Red-headed woodpecker *Melanerpes erythrocephalus*	Threatened	Threatened	• Found in a variety of habitat including open oak and beech forests, grasslands, forest edges, orchards, pastures, riparian forests, roadsides, urban parks, golf courses, cemeteries, along beaver ponds and brooks. • Nests are usually found in dead or dying trees but can also make nests in dead branches of live trees. (Note 2)
Golden-winged warbler *Vermivora chrysoptera*	Threatened	Threatened	• Found in regeneration zones where young shrubs grow, surrounded by mature forest. • Prefer public utility right-of-ways, the edges of fields, areas where logging has recently occurred, beaver ponds and burned-out or intermittently cultivated areas. • Nests are built on the ground in areas of herbaceous plants and low bushes. (Note 2)

Notes:
1) *Source: Species Listed Under the Manitoba Endangered Species Act (Manitoba Conservation, 2013b)*
2) *Source: Species at Risk Public Registry (Government of Canada, 2012)*
3) *Source: COSWIC Assessment and Status Report on the Chestnut-longspur in Canada, (COSWIC 2010)*

A fish presence study was completed as part of the aquatic resources assessment in the 2008 assessment. The report indicated that one fish species (Chestnut Lamprey (*Ichthyomyzon castaneus*) known or suspected to inhabit the Whitemud River has been designated a status of Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). It has not been designated for specific protection under Schedule 1 of SARA or the *Manitoba Endangered Species Act*. However, as of November 2010, this species' status has been reassigned to Data Deficient which applies when the available information is insufficient to either resolve a wildlife species' eligibility for assessment or to permit an assessment of the wildlife species' risk of extinction (COSWIC, 2011).

As indicated in **Sections 3.10.1** and **3.10.2**, a terrestrial survey was completed in the area of the current IWWTF as part of the 2008 assessment. The survey found that there were no protected species identified at the Project Site.

3.13 Settlement and Population

The provincial boundary of Manitoba did not include the Neepawa area when the boundary was first established in 1870 and the Neepawa area was considered part of the Northwest Territories. When the provincial boundary was extended in 1881, the Neepawa area became part of the Province of Manitoba. The Neepawa area was settled by a wave of immigrants from the British Isles followed by groups of Eastern European settlers from 1870 and thirty years thereafter. The Town of Neepawa was incorporated on January 2, 1883. The name Neepawa has its origin in the Cree word for “Land of Plenty. (Town of Neepawa, 2012a)

As of 2011, the Town of Neepawa had an estimated population of 3,629, up 10 percent from the 3,298 given in the 2006 Census data. Between 2006 and 2011, the population increase in the Town of Neepawa was notable when compared to the Province as a whole, which had a 5.2 percent increase between 2006 and 2011. (Statistics Canada, 2012a)

Services provided in the Town of Neepawa include a fire department and a Royal Canadian Mounted Police (RCMP) service. Neepawa also has 911 emergency services. Health care facilities in the Town of Neepawa include: the Neepawa Memorial Hospital (38 beds), two medical clinics and one personal care home (Country Meadows Care Home). (Town of Neepawa, 2012a).

The economy in the Town of Neepawa and the area is very dependent on agriculture. The area supports many types of crops and livestock operations and Neepawa is a major agriculture service centre for many of the producers in the area. (Town of Neepawa, 2012a)

The Town of Neepawa provides potable water to residents from two groundwater wells, Hummerston and Oberon, which are located approximately 19 km south of Neepawa with raw water being fed with a single pipeline. The water is treated with lime softening, filtration and chlorination. Fluoride is also added to the water prior to distribution. Water is distributed to residents via a water tower and holding tank with an approximate storage capacity of 3.5 million litres. Wastewater is treated in a three-cell lagoon system located in the eastern portion of the Town (Town of Neepawa, 2012b).

The Neepawa area is served by Evergreen Environmental Technologies, which is the regional landfill located west of the Town of Neepawa. The landfill is a regional facility serving the R.M.s of Elton, Langford, Minto, North Cypress, and Odanah as well as the Town of Carberry and Town of Minnedosa. (Town of Neepawa, 2012b)

3.14 Transportation

The Town of Neepawa is serviced by major highways (the Yellowhead Highway No. 16 and Provincial Highway No. 5), the Canadian Pacific Railway and air via a runway that is able to accommodate air ambulance and small jets. Neepawa is also serviced by Grey Goose and Greyhound Bus lines (Town of Neepawa, 2012a).

The major roads surrounding the Project Site include Provincial Highway No. 16 to the south, Provincial Highway No. 5 to the west and Provincial Road No. 352 to the east. **Table 16** provides the Average Annual Daily Traffic (AADT) load for these Provincial Highways and Provincial Roads.

Table 16. AADT Counts in the Vicinity of the Project Site (2011)

Road	Count Location	AADT
Provincial Road No. 352	North of intersection of Provincial Road No. 352 and Provincial Highway No. 16	380
Provincial Road No. 352	South of intersection of Provincial Road No. 352 and Provincial Highway No. 16	160
Provincial Highway No. 5	North of intersection of Provincial Highway No. 5 and Provincial Highway No. 16	2,310
Provincial Highway No. 5	South of intersection of Provincial Highway No. 5 and Provincial Highway No. 16	1,410
Provincial Highway No. 16	East of intersection of Provincial Highway No. 16 and Provincial Road No. 352	3,160
Provincial Highway No. 16	West of Provincial Road No. 352 and east of Provincial Highway No. 5	2,990
Provincial Highway No. 16	West of intersection of Provincial Highway No. 5 and Provincial Highway No. 16	3,520

Note:
AADT = Average Annual Daily Traffic

Source: 2011 Annual Average Daily Traffic on Provincial Trunk Highways and Provincial Roads (Manitoba Infrastructure and Transportation Traffic Engineering Branch , 2011).

3.15 Cultural Setting

3.15.1 Heritage Resources

As part of the 2008 assessment, the Heritage Resources Branch - Archaeological Assessment Services Unit of Manitoba Culture, Heritage, Tourism and Sport was contacted to determine the potential for impact to heritage resources in the proposed areas of the then proposed IWWTF. According to the branch records, the potential to impact significant heritage resources was low, and the Heritage Resources Branch had no concerns with the project.

As the proposed alterations at the Project Site will be located on previously disturbed areas and that the 2008 assessment indicated that the potential to impact significant heritage resources was low, no historic resources are anticipated to be encountered during construction.

3.16 Land Use and Development Controls

The Project Site is located within the limits of the Town of Neepawa, Manitoba and is located on land owned by HyLife Foods and the Town of Neepawa (**Figure 1**). The Town of Neepawa is surrounded by the R.M. of Langford and the R.M. of Rosedale.

3.16.1 Regional Land Use

Within the Project Region (10 km radius surrounding the Project Site) as shown in **Figure 7**, an array of urban and rural land uses are apparent. Land use planning and development controls are generally within the purview of the Town of Neepawa, R.M. of Langford, R.M. of Lansdowne and R.M. of Rosedale pertaining to their respective areas. There are currently no First Nation Reserve lands located within the 10 km radius surrounding the Project Site, where development controls would not apply in any event.

There are no Provincial parks located within the R.M.s of Langford, Lansdowne or Rosedale. However, Riding Mountain National Park has existed directly west of the R.M. of Rosedale since obtaining national park status in 1930. Within the R.M. of Langford and the R.M. of Lansdowne, there is a P.F.R.A. Community Pasture located to the southeast of the Town of Neepawa. According to the Neepawa and Area Planning District Development Plan, the Community Pasture was established in 1948 and covers an area of approximately 8,798 ha and is used as an off-farm grazing site for local residents in the community. (Community Planning Services Branch, 2006) There is also a wildlife management area located to the north of the community pasture within the R.M. of Langford.

The overall goals of the Neepawa and Area Planning District are apparent from comments in their Development Plan as shown in the following excerpt:

> *"This Development Plan has the overall goal or objective of enhancing the physical, socio-economic, and environmental opportunities for the people of the Planning District. Inherent in this goal are orderly and efficient development, equality, enhancement or aesthetics and the environment, and the principle of public involvement."*

3.16.2 Local Land Use

Within the Project Area (3 km radius from the Project Site), the R.M. of Langford occupies the largest portion of the 3 km radius study area (approximately 42.4 %) while approximately 35.2% falls within the Town of Neepawa, 19.5% falls within the R.M. of Rosedale and 3% falls within the R.M. of Lansdowne (**Figure 8**). Use and development of land within the local study area is governed by the Neepawa and Area Planning District Development Plan and the Town of Neepawa, R.M. of Langford, R.M. of Lansdowne, and R.M. of Rosedale Zoning By-Laws. The Development Plan and Zoning By-laws include an array of measures designed to regulate and control the development and use of land and buildings.

The current zoning of the Project Site and the land immediately surrounding the Project Site is MH – Industrial Heavy Zone, according to the Town of Neepawa Zoning Maps 1 and 2 (By-law No. 2650). The R.M. of Langford is located to the south, east and north of the Project Site, with the surrounding lands zoned as AG 80 – Agricultural General Zone. West of the Project Site, within the Town of Neepawa, the land is zoned AR – Agricultural Restricted Zone and CH – Commercial Highway Zone. The zoning of the Project Site and the surrounding land is indicated in **Figure 13** with the related zoning designations described in **Table 17**. The predominant designation of land within the 3 km radius Project Area is zoned AG 80 which is an Agricultural General Zone.

Table 17. Zoning Designation Within the 3 km Project Area

Zoning Designation	Description
R.M. of Rosedale	
AR	Agricultural Restricted Zone
R.M. of Langford	
AG 80	Agricultural General Zone
AC 80	Agricultural Conservation Zone
SRR	Seasonal Recreation Residential Zone
R.M. of Lansdowne	
AG 80	Agricultural General Zone
Town of Neepawa	
AR	Agricultural Restricted Zone
AR-C	Agricultural Restricted – Commercial Zone
AR-R	Agricultural Restricted – Residential Zone
AR-O	Agricultural Restricted – Open Space Zone
CH	Commercial Highway Zone
CC	Commercial Central Zone
I	Institutional Zone
O	Open Space Zone
MH	Industrial Heavy Zone
RM-1	Residential Multiple-Family Zone
RM-2	Residential Multiple-Family Zone
RR2	Residential Rural Zone
RS	Residential Single-Family Zone
RS-U	Residential Single-Family Unserviced
RT	Residential Two-Family Zone

3.16.3 Dwellings and Businesses

According to the Statistics Canada 2011 census results, there were a total of 3,629 residents living in 1,528 occupied private dwellings in the Town of Neepawa (Statistics Canada, 2012a). The R.M. of Langford had a total population of 767 living in 281 dwellings (Statistics Canada, 2012b) while the R.M. of Lansdowne had a total population of 723 residents living in 272 dwellings, and the R.M. of Rosedale had a total population of 1,627 residents in 604 dwellings (Statistics Canada, 2012c,d).

As part of the 2008 assessment, to determine the number of dwellings within a 3 km radius of the Project Site, digital air photos, topographic information and land ownership maps were examined. It was found that the majority of the dwellings, businesses, services, and other places of gathering were located within a 2 km and 3 km radius of the

Project Site. Further, there were no strip malls, schools, day cares, nursery schools, senior care facilities, churches, or medical services within a 1 km or 2 km radius of the Project Site. (EarthTech, 2008)

The services, facilities, and places of gathering found within a 3 km radius of the Project Site are summarized in the following table according to the street/avenue on which they are located.

Table 18. Listing of All Schools, Day Cares / Nursery Schools / Senior Care Facilities, Churches, and Medical Services Within a 3 km Radius of the Project Site

Location	Schools	Day Cares / Nursery Schools / Senior Care Facilities	Churches	Medical Services
1st Avenue	N/A	• Elks Neepawa Manor	• Knox Presbyterian Church • St. Dominic's Roman Catholic Church	• Mountain Medical Clinic • Neepawa & District Ambulance Service
Mountain Avenue	N/A	N/A	• St. John's Ukrainian Catholic Church • St. James Anglican Church • Neepawa United Church	N/A
Davidson Street	• Assiniboine Community College	• Neepawa Nursery School • Yellowhead Manor • Kinsmen Courts	N/A	N/A
Hospital Street	• Neepawa Area Collegiate	N/A	N/A	• Neepawa Health Services, Hospital
Hamilton Street	N/A	• Budz'n Bloom Daycare Centre	• Calvary Chapel	N/A
Broadway Avenue	N/A	N/A	• Christ Lutheran Church	N/A
Ellen Street	N/A	N/A	N/A	• Dr. G.H.E. Ong Medical Corp.

Notes:
1. *All names and locations obtained from Town of Neepawa Business Directory (Neepawa & District Chamber of Commerce, 2012) and Town of Neepawa Community Profile (Town of Neepawa, 2012a).*
2. *N/A = Not Applicable: no schools, day cares / nursery schools / senior care facilities, churches, or medical services on the specified street/avenue within the given radii.*

It was found that 1st Avenue, Mountain Avenue, and Davidson Street in the Town of Neepawa contain most of the schools, day cares, nursery schools, senior care facilities, churches, or medical services within a 3 km radius of the Project Site.

4. Assessment Approach

To assess the potential environmental effects of the project, clearly defined temporal and geographic boundaries were utilized as presented in the following sections.

Construction of the previously approved HyLife Foods snap chill and cooler is anticipated to begin in early 2013 and is not included in this assessment as they have already been approved as a minor alteration as part of a previous NOA.

4.1 Geographic Boundaries

The following are the spatial boundaries defined for this report. However, where specifically noted, these boundaries may be adjusted to suit the environmental component affected.

- The **Project Site** includes any land on the HyLife Foods or IWWTF property that is likely to be directly disturbed by project activities.
- The **Project Area** includes any area, up to 3 km beyond the Project Site, which could be disturbed by project effects. This includes effects during construction, such as noise, vehicle emissions, traffic, etc.
- The **Project Region** includes an area up to 10 km beyond the Project Site that may be affected by project activities. Effects that may be seen outside the Project Area may include items such as increased traffic.

4.2 Temporal Boundaries

The temporal boundaries of the assessment were divided into the construction, operation and decommissioning phases as outlined below.

4.2.1 Construction Phase

The start of the construction phase is dependent on approval by Manitoba Conservation and Water Stewardship, which is anticipated by July 2013. Depending on the date of approval, the cut floor expansion at the HyLife Foods pork processing facility is anticipated to begin in September 2013 (approximately nine months of construction). This will be followed by the construction of the casings/heparin line (approximately nine months of construction) and the employee welfare area (approximately six months of construction) that are anticipated to begin in the spring of 2014 Construction at the IWWTF is anticipated to begin in the spring of 2014 with an approximate construction schedule of nine months.

4.2.2 Operation Phase

Assuming nine months of construction, the cut floor expansion and the casings/heparin line at the HyLife Food pork processing facility are anticipated to be operational in mid-2014 and late 2014, respectively. The employee welfare area at the HyLife Foods facility is anticipated to be fully operational by late 2014 along with the IWWTF. HyLife Foods will ensure current license limits are met on the IWWTF effluent at all times during construction and operation of the pork processing plant.

4.2.3 Decommissioning Phase

There are currently no plans to decommission the HyLife Foods pork processing facility or IWWTF. For the purpose of this assessment, construction effects are anticipated to be similar to decommissioning effects. As such, no specific plans to decommission the Project Site have been developed. When the Project Site needs to be decommissioned at some point in the future, a site decommissioning plan will be filed with appropriate regulators prior to decommissioning.

For the purposes of this assessment, the decommissioning phase effects are anticipated to be similar to the construction phase and as such were not assessed separately.

4.3 Environmental and Social Components

This environmental assessment considers changes to the environment caused by the project, as well as any resultant effects on the socio-economic environment by scoping for appropriate Environmental Components (ECs) and Social Components (SCs). For this project, ECs and SCs were selected based on the Manitoba *Environment Act* Proposal (EAP) Report Guidelines.

The potential for project interactions with ECs and subsequent interactions with SCs are identified in **Table 19**. Potential interactions were identified based on the professional judgement of the assessor combined with assumed implementation of standard environmentally responsible construction techniques and operating procedures in the course of the project construction and operation. The potential interactions identified in **Table 19** are assessed in **Section 5**. Mitigation measures and residual effects are also described in **Section 5**.

For the purpose of this assessment, ECs that were assumed not to be a potential concern at the Project Site as described in **Section 3** were not included in **Table 19**. Potential environmental effects that may be caused by malfunctions or accidents are discussed separately in **Section 5.13**.

4.3.1 Environmental and Social Components Definitions

Below is a brief description of each EC and SC component.

- Topography – includes the natural or artificial surface of the Project Site.
- Air and Noise – is described in terms of levels of pollutants in the air and the level of noise.
- Climate – is the level of precipitation, temperature, wind patterns, etc.
- Soil – is described in terms of soil quality and soil quantity.
- Surface Water & Aquatic Resources – is described in terms of the quality of surface water and aquatic resources (fish and fish habitat).
- Groundwater – for the purposes of this report, groundwater is described as groundwater quality and quantity.
- Vegetation and Wildlife – is described as the presence and abundance of natural vegetation and wildlife including protected species including habitat modification.
- Protected Areas (land use) – for the purposes of this report, protected areas include the Whitemud Watershed Wildlife Management Area and the adjacent P.F.R.A. Community Pasture.
- Heritage Resources – includes historical heritage artifacts and/or features or skeletal remains.
- Aesthetics – includes the visual appeal of the Project Site.

Table 19. Interaction Matrix

5. Assessment of Environmental Effects and Mitigation Measures

5.1 Effects Assessment Methodology

AECOM has applied professional judgment and a thorough understanding of the proposed project (described in **Section 2** of this report) and the existing environment (described in **Section 3**), to determine the potential for the proposed project to interact with each Environmental Component. **Table 19** (in **Section 4** of this report) displays these potential interactions, which are the subject of the analyses set out in the sections below. Mitigation measures that have been incorporated into the proponent's proposed plan are taken into account, as well as the environmental protection practices and procedures included in the proponent's operation.

Environmental effects that may be caused by malfunctions or accidents are discussed separately in **Section 5.13**.

Technical terms used in the analysis are defined in **Table 20**.

Table 20. Factors and Definitions Considered in Assessing Environmental Effects

Project Phase:	Refers to the phase of the project as construction, operation or decommissioning.
Potential Effect:	Classification of the type of effects possible during a specific project phase.
Magnitude of Effect:	Refers to the estimated percentage of population or resource that may be affected by activities associated with the construction, operation and decommissioning of the proposed project. Where possible and practical, the population or resource base has been defined in quantitative or ordinal terms (e.g., hectares of soil types, units of habitat). Magnitude of effect has been classified as either less than (<) 1%, 1% to 10%, or greater than (>) 10% of the population or resource base. Where the magnitude of an effect has been defined as virtually immeasurable and represents a non-significant change from background in the population or resource, the effect is considered negligible. An exception to this is in terms of potential human health effects where, for example health issues due to water-borne diseases amounting to 1% of the population being affected would still be considered major.
Direction of Effect:	Refers to whether an effect on a population or a resource is considered to have a positive, adverse or neutral effect.
Duration of Effect:	Refers to the time it takes a population or resource to recover from the effect. If quantitative information was lacking, duration was identified as short-term (<1 year), moderate term (1 to 10 years) and long term (>10 years).
Frequency of Effect:	Refers to the number of times an activity occurs over the project phase, and is identified as once, rare, intermittent, or continuous.
Scope of Effect:	Refers to the geographical area potentially affected by the effect and was rated as Project Site, Project Area or Project Region as defined in **Section 4**. Where possible, quantitative estimates of the resource affected by the effect were provided.
Degree of Reversibility:	Refers to the extent an adverse effect is reversible or irreversible over a 10-year period.
Residual Effect:	A qualitative assessment of the residual effect remaining after employing mitigation measures in reducing the magnitude and/or the duration of the identified effect on the environment.

Magnitude of Effect	Direction of Effect	Duration of Effect	Frequency of Effect	Scope of Effect	Degree of Reversibility of Effect
Negligible (immeasurable)	Positive	Short term (< 1 year)	Once	Project Site	Reversible
Minor (<1%)	Adverse	Moderate (1 to 10 years)	Rare	Project Area	Irreversible
Moderate (1 to 10%)	Neutral	Long term (>10 years)	Intermittent	Project Region	
Major (>10%)			Continuous		

The following sections assess the potential interactions between Environmental Components and the proposed construction and operation of the HyLife Foods facility and IWWTF, taking mitigation measures into account and identifying residual adverse effects. The analysis also includes any effects on Social Components that may result from significant residual adverse effects. AECOM characterized any measurable residual adverse effect, based on the magnitude, scope, duration/frequency and reversibility of that effect.

A summary table of the potential effects, mitigation measures and residual effects is included in **Table 22**.

5.2 Topography

5.2.1 Construction/Decommissioning

During the construction phase, changes to the Project Site topography can result from stockpiling of earthen material and from clearing, excavating and compacting within the building expansion footprint and the footprint of the new aeration tank. The construction phase will include restoration of the site topography to match the surrounding area to the extent that is practical in the event that rutting or changes to site topography occur. Restoration of the topography may include re-grading and contouring within the Project Site.

Due to the limited changes to the Project Site topography during construction, effects on topography are anticipated to be negligible in magnitude, of short term duration, occurring intermittently during the construction phase at the Project Site and are considered reversible. The residual effect on topography is considered neutral and negligible with the implementation of site restoration during the construction phase.

5.2.2 Operation

During the operation phase of the proposed project, no changes to site topography are anticipated.

5.3 Air and Noise

5.3.1 Construction/Decommissioning

5.3.1.1 Noise

Noise will be generated to varying degrees during the construction phase and has the potential to negatively affect people and local wildlife in the surrounding area. Construction noise may be expected to arise from the arrival and use of heavy equipment at the Project Site, increased traffic and associated construction noises. The construction noise is expected to be typical of heavy equipment, such as trucks, graders, loaders and excavators. Noise from construction tools, such as hammers, drills, saws etc. are expected throughout the construction phase.

As indicated in **Section 3.10.2**, there were no rare/endangered wildlife species identified at the Project Site during the 2008 assessment. Also as the proposed construction areas on the Project Site have previously been disturbed and are covered by either gravel or grass, the construction areas are not anticipated to provide wildlife habitat. However, as indicated in the 2008 assessment, wildlife may be present within the Project Area.

However, as the Project Site is an active pork processing facility and IWWTF that consists of activities associated with the MH-Industrial Heavy zoning designation, it is unlikely that there will be noise sensitive species in the area. It is also unlikely that the construction of the proposed project will increase the noise level substantially over the short term duration. General construction activities are anticipated to generate intermittent noise over a short period.

The closest residential receptor is located approximately 400 m west of the entrance to the HyLife Foods pork processing facility along Provincial Highway No. 16. According to satellite imagery, this residence appears to have a forested area approximately 60 m in length separating it from the Project Site which will reduce general noise from HyLife Foods. However, as indicated in **Section 3.14**, the A.A.D.T. count along Provincial Highway No. 16 west of Provincial Road No. 352 and east of Provincial Highway No. 5 is 2,990 vehicles per day. It is assumed that this residence located along this major highway is accustomed to some level of noise however, if excessive noise complaints are received during the construction phase of the proposed project, HyLife Foods will address these concerns as they arise on an individual basis.

Noise effects will be mitigated with the implementation of the following measures:

- Construction hours will be limited as required to normal working hours.
- Vehicles and equipment will be properly maintained.
- Provide hearing protection to workers/employees as required.
- HyLife Foods will address noise concerns as they arise on an individual basis.

Due to the short length of the construction phase, and as the Project Site is an active pork processing facility and IWWTF located along a major highway, residual noise effects on people and wildlife due to construction are anticipated to be minor to negligible in magnitude, of short term duration, occurring intermittently during the construction phase at the Project Site and surrounding Project Area.

5.3.1.2 Exhaust Emissions

There exists potential for air quality effects due to vehicle and construction equipment emissions during the construction phase of the proposed project. Emissions are expected to be generated during equipment arrival and movement at the Project Site, including during clearing, excavating and compacting of the proposed building expansion footprint and the footprint of the new aeration tank. These emissions could decrease the quality of the air by increasing the local concentration of carbon monoxide, carbon dioxide, particulate matter and nitrogen oxides in the air with potential for subsequent effects on human health. Effects on air quality due to exhaust emissions during construction will be mitigated with the implementation of the following mitigation measures:

- Vehicles and equipment will be properly maintained.
- Vehicle idling will be kept to a minimum.

With the implementation of these mitigation measures, vehicle and equipment exhaust emissions are anticipated to result in a potentially minor decrease in air quality at the Project Site and a negligible decrease in air quality off the Project Site. These effects will be of short term duration, potentially occurring on a continuous basis during working hours of the construction phase.

5.3.1.3 Dust Generation

During vehicle, equipment and earth movement (including stockpiling), air quality may be affected by dust and particulates with subsequent effects on human health (including respiratory issues) and vegetation (dust deposition) during the construction phase.

To mitigate potential air quality effects due to dust, the following mitigation measures will be undertaken:

- Material stockpile heights will be limited.
- The disturbed/exposed areas will be kept to a minimum.
- If required, additional dust suppression activities, such as spraying material stockpiles and work areas with water, will be completed.

With these mitigation methods employed as necessary, the residual effects of dust generation on air quality and subsequent effects on human health and vegetation are expected to be negligible, occurring intermittently over the short term at the Project Site.

5.3.2 Operation

5.3.2.1 Exhaust Emissions

HyLife Foods

During the operational phase, there will be increased traffic to/from the HyLife Foods pork processing facility due to the increase in pork processing at the facility as indicated in **Section 2.7**. The increased traffic will result in an increase of vehicle emissions which has the potential to negatively affect air quality. Exhaust emissions could decrease the quality of the air by increasing the local concentration of carbon monoxide, carbon dioxide, particulate matter and nitrogen oxides in the air with potential for subsequent effects on human health.

Currently there are approximately 62 trucks/day travelling to/from the HyLife Foods site as indicated in **Section 2.7**. However, with the proposed increase in pork processing the amount of trucks travelling to/from the site will increase to 83 trucks/day. There is also a skid steer on-site that is used on an as-needed basis to move DOA and euthanized hogs to the dead stock bin located north of the processing facility. As indicated in **Table 5** in **Section 2.5.1**, diesel use for the skid steer is anticipated to increase to 175 L/week from 165 L/week and would contribute additional exhaust emissions as well.

With the proposed increase in pork processing, approximately 300 additional employees will be required at the pork processing facility, bringing the total number of employees to approximately 1,250. HyLife Foods reports that significant carpooling occurs with the present employees and is expected to continue. Therefore, due to the continued carpooling at the Project Site, exhaust emissions due to employee vehicles is anticipated to negligibly decrease air quality at the Project Site.

Effects on air quality due to exhaust emissions during operations will be mitigated with the implementation of the mitigation measures identified in **Section 5.3.1.2**.

As HyLife Foods currently operates two kill shifts (at a reduced rate), the singer's natural gas exhaust emissions are not anticipated to change as the second shift, though operating at a reduced throughput presently, operates for the full production time, therefore, no increase in intensity or duration of operation time is expected within the singer.

With the implementation of these mitigation measures, exhaust emissions are anticipated to result in a potentially minor decrease in air quality at the Project Site and a negligible decrease in air quality in the Project Area. These effects will be of short term duration, occurring on an intermittent basis during working hours of the HyLife Foods pork processing facility.

IWWTF

During the operation of the IWWTF, there will be a slight increase in traffic travelling to/from the site due to material/chemical deliveries, screenings disposal and sludge roll-off-bin removal. The increased traffic will result in an increase in total vehicle emissions with potential negative effects to air quality as outlined above.

Currently, there are approximately 5 trucks/week travelling to/from the IWWTF site as indicated in **Section 2.7** and this will increase to 7 trucks/week to accommodate the increase in sludge roll-off-bin removal, screening disposal and material/chemical deliveries. There is also a truck located on-site used to move the BFI bins that store the sludge produced at the IWWTF. Currently, 852 L/year of diesel fuel is used but with the proposed increase in pork processing at HyLife Foods, the diesel usage will increase to 1,150 L/year and as such will contribute additional exhaust emissions as well.

Effects on air quality due to exhaust emissions during operations will be mitigated with the implementation of the mitigation measures identified in **Section 5.3.1.2**.

With the implementation of these mitigation measures, vehicle exhaust emissions are anticipated to result in a negligible decrease in air quality at the Project Site and a negligible decrease in air quality in the Project Area. These effects will be of short term duration, occurring on a continuous basis during the working hours of the IWWTF.

5.3.2.2 Noise

HyLife Foods

Noise will be generated to varying degrees during the operation phase and has the potential to negatively affect people and local wildlife in the surrounding area. As indicated in **Section 5.3.2.1**, with the proposed increase in pork processing at HyLife Foods, the number of vehicles travelling to/from the site will increase which in turn has the potential to increase traffic noise at the Project Site and in the Project Area.

The receiving pens at the HyLife Foods facility have the capacity to hold 4,000 hogs at one time and there are no changes proposed to increase this maximum hog storage capacity. Due to this maximum allowable capacity, there will not be an increase in noise due to the live hog storage as the number of hogs in the receiving pens will not increase. No other new sources of noise are anticipated during the operational phase at the HyLife Foods facility.

As indicated in **Section 3.10.2**, there were no rare/endangered wildlife species identified at the Project Site during the 2008 assessment. General operation activities are anticipated to generate intermittent shot term noise during the operational phase. However, as the Project Site includes an active pork processing facility and IWWTF, it is unlikely that there will be noise-sensitive species in the area. It is also unlikely that the operation of the proposed project and the increase in traffic to/from the Project Site will increase the noise level substantially.

The closest residential receptor is located approximately 400 m west of the entrance to the HyLife Foods pork processing facility along Provincial Highway No. 16. According to satellite imagery, the property at this residence appears to include a treed area approximately 60 m in width separating it from the Project Site which will reduce general noise from HyLife Foods. Currently there are approximately 65 trucks/day travelling to/from the HyLife Foods site and with the proposed increase in pork processing the number of trucks travelling to/from the site will increase to 85 trucks/day. However, as indicated in **Section 3.14**, the A.A.D.T. count along Provincial Highway No. 16 west of Provincial Road No. 352 and east of Provincial Highway No. 5 is 2,990 vehicles per day. This residence is located approximately 40 m north of Provincial Highway No. 16 and approximately 430 m west of the HyLife Foods facility. It is assumed that this residence located along this major highway is accustomed to typical highway traffic noise and the current operations of HyLife Foods however, if excessive noise complaints are received during the operation of the facility, HyLife Foods will address these concerns as they arise on an individual basis.

Noise will be mitigated with the implementation of the following measures:

- Vehicles and equipment will be properly maintained.
- Vehicle idling kept to will be a minimum.
- HyLife Foods will address noise concerns as they arise on an individual basis.

There have reportedly been no noise complaints due to the daily operations at HyLife Foods from 2007 to present. HyLife Foods is committed to working with local residents should noise issues arise. As the HyLife Foods pork processing facility is located along a major highway and has been operated as a pork processing facility by HyLife Foods since 2007, the incremental noise effects due to the proposed operations at the facility are anticipated to be

negligible in magnitude to the receptors, of short term duration, occurring intermittently during operation at the Project Site and surrounding Project Area.

IWWTF

During the operation of the IWWTF, noise will increase at the Project Site due to the increase in traffic traveling to/from the site with material/chemical deliveries, screenings disposal and sludge roll-off-bin removal. There are currently approximately 5 trucks/week travelling to/from the IWWTF site and this will increase to approximately 7 trucks/week.

As mentioned previously, as the Project Site is an active pork processing facility and IWWTF that consists of activities associated with the MH-Industrial Heavy zoning designation, it is unlikely that there will be noise sensitive species in the area. It is also unlikely that the 2 trucks/week increase in traffic to the IWWTF will increase the noise level substantially over the long term duration. As indicated previously, the nearest residential receptor is located approximately 40 m north of Provincial Highway No. 16, approximately 110 m east of the entrance road to the IWWTF and approximately 410 m south of the IWWTF. There is a forested area approximately 60 m in width separating the property at the residence from the Project Site which will reduce general noise from the IWWTF. Due to the residence's long term proximity to the highway it is assumed that this residence is accustomed to noise typical of the highway and IWWTF operations, therefore the incremental increase in noise effects due to the increase in traffic to the IWWTF is anticipated to be negligible and no further mitigation is proposed. If excessive noise complaints are received during the operation of the IWWTF, R3 Innovations Inc. will address these concerns as they arise on an individual basis.

Noise effects due to the operation of the upgraded sludge pumps are not anticipated to contribute to the overall noise at the Project Site as this equipment will be located within the screening/pumping building. Air will be provided to the aeration tank by the existing blower unit; the proposed additional blower unit will be available on-site only as backup therefore no additional noise from the blower unit is anticipated.

With the implementation of these mitigation measures and as the Project Site is located along a major highway, the noise effects due to the increased traffic at the IWWTF are anticipated to be negligible in magnitude, of short term duration, occurring intermittently during the operation at the Project Site and surrounding Project Area.

5.3.2.3 Odours

HyLife Foods

There is potential for increased odour generation at HyLife Foods and the IWWTF due to the increase in hog processing at the HyLife Foods facility. The primary sources of odour at the HyLife Foods facility include the manure handling at the receiving pens, the storage of spent bedding material and the storage of DOA and euthanized hogs.

The manure from the receiving pens will not increase as there is no proposed change to the maximum allowable hog storage capacity (4,000 hogs) proposed as a result of this application. Therefore, there is no expected increase in waste generated by the hogs stored in these receiving pens and there is no expected increase in odours as a result.

The volume of waste bedding material recovered from the in-bound hog trucks will increase in proportion to the increase in the number of hog trucks. Currently there are approximately 24 trucks/day traveling to the site with hogs and it expected to increase to approximately 33 trucks/day. The bedding material and the manure contained within it will continue to be temporarily stockpiled on the site, north of the processing facility. There are no proposed changes to the temporary stockpile area however there will be an increase in the number of trucks removing this

material from the site. Currently during the summer months there are approximately 3 – 5 trucks/week and in the winter months there are approximately 10 – 15 trucks/week traveling to the site to remove this material. With the proposed increase in hog processing, during the summer months, approximately 4 – 7 trucks/week will be required to remove this material and approximately 13 – 21 trucks/week will be required during the winter months. The bedding material and the manure contained within it will continue to be field-stored (consistent with current operations) and land applied in accordance with the requirements of the MLMMMR.

The number of hogs euthanized and DOA hogs is expected to increase in proportion to the increase in hogs processed at HyLife Foods. Currently there are approximately 183 hogs/week that are DOA hogs and this is estimated to increase to approximately 249 hogs/week. These hogs are stored in a dead stock bin located north of the processing facility next to the truck scrape out area. The number of trucks transporting renderable material and DOAs will remain the same as there is sufficient spare capacity in these trucks. **Section 2.6.1** provides details on DOA hog management and there are no proposed changes to the current management of DOA hogs.

To date, there have not been any odour complaints reported to HyLife Foods due to the operations at the HyLife Foods facility. If odour complaints are received by Manitoba Conservation and Water Stewardship or HyLife Foods, due to the daily operations of the facility, HyLife Foods will address concerns as they arise on an individual basis.

As the capacity of the receiving facility will not increase and as the existing operational practices such as the regular removal of waste bedding material and euthanized and DOA hogs will continue, the residual odour effects of the operation are anticipated to be negligible in magnitude, of short term duration, occurring continuously during the operation phase at the Project Site and surrounding Project Area.

IWWTF

The wastewater treatment at the IWWTF is an aerobic process therefore no methane is generated. Also, the sludge produced at the facility is dewatered prior to being transferred into the BFI roll-off-type bins which further decreases potential for odour generation from the sludge. The existing daily practices at the IWWTF during operation will continue. There have been no odour complaints reported to HyLife Foods to date due to the daily operations at the IWWTF however, should odour complaints arise, HyLife Foods and the Town of Neepawa will address these complaints on an individual basis. As such, negligible residual odour effects are anticipated from the daily operations at the IWWTF.

5.4 Climate

5.4.1 Construction/Decommissioning

5.4.1.1 Emissions Generation (including Greenhouse Gasses)

Vehicle and equipment movement at the Project Site will be necessary during the construction phase including clearing, excavating, compacting, transportation and stockpiling of materials and site restoration.

During construction activities, air quality may be affected due to vehicle and construction equipment emissions as described in **Section 5.3.1.2**. Vehicle and equipment used during construction will also generate greenhouse gas emissions including carbon dioxide and nitrous oxides. Greenhouse gas emissions have the potential to affect climate through climate change.

To mitigate the potential generation of greenhouse gas emissions at the Project Site, mitigation measures identified in **Section 5.3.1.2** will be implemented.

Greenhouse gas emissions will be generated on a continuous basis during working hours but based on the small scale of the project, will be negligible in magnitude in the Project Area. Negligible negative effects on climate will occur over the long term and are considered irreversible.

5.4.2 Operation

5.4.2.1 Greenhouse Gas Emissions

Manitoba Conservation's *Environment Act Proposal Report Guidelines* provide for climate change implications, including a greenhouse gas inventory, to be included in an assessment of the anticipated environmental effects of a development. The Guidelines indicate that the inventory should be calculated according to guidelines developed by Environment Canada and the United Nations Framework Convention on Climate Change. According to Environment Canada's technical guidance document, reported emissions are to include direct emissions associated with the operation of a contiguous facility. (Pollutant Inventories and Reporting Division, Environment Canada 2012) **Appendix B** includes a facility level estimate of direct greenhouse gas emissions associated with the existing HyLife Foods facility and the R3 Innovations IWWTF and the proposed alterations at these facilities and has been prepared in accordance with these documents.

As detailed in **Appendix B**, greenhouse gas emissions are currently generated at both the pork processing facility and the IWWTF and are anticipated to increase with the proposed changes at the developments. The following table provides a summary of the existing and anticipated carbon dioxide equivalent (CO_2e) emissions for the pork processing facility and the IWWTF.

Table 21. Current and Anticipated Carbon Dioxide Equivalent Emissions

	HyLife Foods	IWWTF
Current Emissions Total CO_2e (tonne CO_2e/year)	9,266	65
Anticipated Emissions Total CO_2e (tonne CO_2e/year)	9,593	66

The proposed changes will result in a 4% increase in greenhouse gas emissions at the pork processing facility whereas greenhouse gas emissions at the IWWTF will increase by 2%. Environment Canada's mandatory reporting threshold for greenhouse gas emissions is 50,000 tonnes of CO_2e on an annual basis. As the pork processing facility and the IWWTF are not anticipated to generate even a quarter of the reporting threshold, they are not considered significant contributors of greenhouse gas emissions in the Province.

To determine the magnitude of the increase at the Provincial level, the greenhouse gas emissions reported for the Province of Manitoba in Canada's National Inventory Report 1990-2009 were examined. According to the report, the Province of Manitoba emitted a total of 20,300,000 tonnes of CO_2e (Pollutant Inventories and Reporting Division, Environment Canada, 2011). Therefore the HyLife Foods facility and the IWWTF greenhouse gas emissions are considered to be a negligible increase in greenhouse gas emissions at the Provincial level.

Both facilities are anticipated to have a negligible effect on climate which will continuously during facility operation occur over the long term.

5.5 Soils

5.5.1 Construction/Decommissioning

5.5.1.1 Soil Compaction and Mixing

As a result of incidental vehicle and equipment movement, along with excavations and stockpiling of material at the Project Site during construction, there is the potential to cause soil compaction and mixing of soil horizons which may reduce available air and water storage and change the soil structure. Soil compaction also has the potential to change surface drainage patterns and reduce flora growth.

To mitigate potential soil compaction and mixing of soil horizons, the following measures will be implemented:

- Construction equipment and vehicle movements will be limited to designated roads/pathways within and around work areas.
- Construction activities during periods of extensive precipitation/runoff will be limited.
- Disturbed/exposed areas will be kept to a minimum with site restoration occurring as soon as practical where required.
- Topsoil will be stripped and stockpiled on the Project Site for use in site restoration.
- The contractor will be responsible for the appropriate repair of any areas where equipment has compacted soils with the repairs including appropriate grading and site restoration (if required).

As the proposed construction areas on the Project Site have been previously disturbed (gravel and grass covered), the potential for compaction and soil mixing effects are reduced. With the implementation of the proposed mitigation measures, the residual effects on soils due to compaction and mixing are anticipated to be negligible in magnitude, limited to the Project Site, and will occur intermittently over the short term during the construction phase.

5.5.1.2 Soil Erosion

Soil may be lost during the construction phase due to erosion from wind and precipitation/runoff. Conditions favourable for erosion have the potential to occur during clearing, excavation and infilling work, stockpiling, site restoration, and movement of equipment on the Project Site. Erosion of soil and material stockpiles due to wind has the potential to cause subsequent effects on air quality (dust and particulate matter) and flora (decreased growth due to dust deposition). Aggregate and salvaged topsoil will be temporarily stockpiled at the Project Site for use in the construction and site restoration process.

The proposed project will disturb an area of approximately 1,964 m^2 which includes the footprints of the aeration tank (161 m^2) at the IWWTF and the following building expansions at HyLife Foods; casings and heparin operation (353 m^2), cut floor expansion (910 m^2), welfare area (364 m^2) and mechanical room (176 m^2).

To mitigate potential soil erosion effects, mitigation measures described in **Section 5.3.1.3** will be implemented. With the implementation of these mitigation measures, soil effects due to erosion during the construction phase are anticipated to be negligible to minor in magnitude, reversible and occurring intermittently over the short term at the Project Site.

5.5.2 Operation

5.5.2.1 Soil Resources

HyLife Foods

As a result of the proposed increase in pork processing at HyLife Foods, there will be an increase in the amount of truck scrapings/bedding material generated. This material will continue to be land applied and stored in accordance with the MLMMMR and as such, the operational phase of the proposed project is not anticipated to affect soil resources and subsequently surface water and groundwater resources.

IWWTF

Due to the proposed increase in pork processing at HyLife Foods, there will be an increase in the amount of sludge produced at the IWWTF. There are three sludge streams generated at the IWWTF as described in **Section 2.3.1.7**; sludge from the first stage DAF, second stage DAF (not currently in use) and WAS produced in the membrane bioreactors. This material will continue to be transferred into a roll-off-type bin provided by BFI Canada Ltd. who will continue to manage the disposal of the sludge at their facility near Winnipeg in the Rural Municipality of Rosser. As such, the operational phase of the IWWTF is not anticipated to directly affect soil resources and subsequently surface water and ground water resources.

5.6 Surface Water/Fish and Fish Habitat

5.6.1 Construction/Decommissioning

The construction of the proposed project will not affect surface water, fish or fish habitat at the Project Site, Area or Region as potential activities will be generally be limited to the soil environment and the nearest water body, the Whitemud River, is located approximately 1,000 m northwest of the Project Site. Specifically, the Whitemud River is located approximately 700 m northwest of the proposed location of the new aeration tank and approximately 1,120 m northwest of the proposed location of the casings and heparin operation building.

Based on the separation distance between the Whitemud River and the construction areas, the construction phase of the proposed project is not anticipated to affect surface water quality, fish or fish habitat.

5.6.2 Operation

The increase in pork processing will result in an increase in wastewater generated at the HyLife Foods facility which in turn will increase the amount of wastewater treatment required at the IWWTF. All wastewater generated at the HyLife Foods pork processing facility is transferred to the IWWTF for treatment.

As indicated in **Section 2.3.2.1**, the proposed alterations will result in 1,200 m^3/day of wastewater generated at the HyLife Foods pork processing facility.

The proposed alterations at the IWWTF will accommodate the proposed expansion of HyLife Foods while still meeting treatment requirements of the IWWTF *Environment Act* License No. 2870 as shown in **Table 8** in **Section 2.6.2.1**. The weekly equalized flow of 1,200 m^3/day from the HyLife Foods facility is less than the equalized licensed design flow of 1,520 m^3/day of the IWWTF. The discharge will continue to occur via the existing effluent outfall pipeline to the low area near the Whitemud River with effluent discharging on a continuous basis.

R3 Innovations staff will continue to conduct effluent monitoring on a daily basis and provide monthly compliance reports to Manitoba Conservation and Water Stewardship as per license requirements. Also, a portion of the treated effluent can be recycled for use at the facility as non-potable utility water (as described in **Section 2.3.1.5**). This practice will continue for the proposed alterations and will be operated as described in the previous NOA request (July 2010).

In rare cases, process upsets may occur for a variety of reasons that may affect the treatment at the IWWTF. In the event that pre-discharge monitoring/testing indicates that treated effluent quality does not meet *Environment Act* License conditions, R3 Innovations Inc. will temporarily divert the effluent to the former IWWTF cells located to the east of the existing IWWTF (as is current practice). This water will be tested for compliance with *Environment Act* License conditions and will be either discharged to the Whitemud River (if license requirements are met), bled back into the IWWTF for additional treatment or transferred to the Town of Neepawa Municipal Lagoon for additional treatment. In any case where treatment limits are not met and these contingencies must be enacted, Manitoba Conservation and Water Stewardship will be notified.

With the installation of additional equipment identified in **Section 2.3.2** at the IWWTF and the continued effluent monitoring, the IWWTF will to be able to continue to meet the existing *Environment Act* License requirements. As the IWWTF will remain within the licensed flow requirements of 1,520 m^3/day, no effects beyond those previously approved in the *Environment Act* License No. 2870 are anticipated.

5.7 Groundwater

5.7.1 Construction/Decommissioning

As indicated in **Section 3.4.2**, groundwater is encountered at the current IWWTF site at depths ranging from 1.8 to 2.4 m below the ground surface. As the proposed construction at HyLife Foods and the IWWTF is anticipated to be slab on grade, substantial dewatering is not anticipated to be required at the Project Site. As dewatering is not anticipated during construction, no groundwater effects are anticipated. Mitigation measures for potential groundwater effects due to accidents and malfunctions are identified in **Section 5.15**.

5.7.2 Operation

HyLife Foods

As a result of the proposed increase in pork processing at HyLife Foods, there will be an increase in the amount of truck scrapings/bedding material generated. This material will continue to be land applied and stored in accordance with the MLMMMR and as such, residual effects to groundwater resources and subsequent effects on surface water and fish and fish habitat as a result of land application of this material are anticipated to be negligible.

IWWTF

The proposed aeration tank will be a 14.3 m diameter aboveground insulated steel tank with piping connections to the treatment train. The tank will be designed in accordance with appropriate design and building codes and will include an engineered foundation that will typically include leak preventative measures. The aeration tank will be filled with treated effluent and monitored for leaks by the contractor. Once it is determined that there are no leaks, the treated effluent will then be released via existing discharge. Typically after one year of operation, a warranty inspection of the tank will be completed. Regular visual observations on tank conditions during operation will be made to identify any potential stresses or indications of failures as part of the ongoing maintenance inspection

routine at the IWWTF. Also, to prevent pipeline leakages, new pipes will be tested prior to operation to identify any potential leaks.

If leaks are identified during the operation of the IWWTF, the Town of Neepawa and HyLife Foods will be notified and will investigate the source of the leakage. If the inspection of the aeration tank indicates a potential concern/failure in the infrastructure, the Town of Neepawa along with HyLife Foods will also be notified. The investigation will be conducted with the intent to repair any potential problems as well as to provide monitoring and investigations to ensure the surrounding land and groundwater has not been contaminated and no risk to human health exists as a result. With the implementation of these mitigation measures, the residual on and off-site effects to groundwater are anticipated to be negligible to minor in magnitude, of short term duration, occurring rarely at the Project Site.

5.8 Vegetation and Wildlife

5.8.1 Construction/Decommissioning

5.8.1.1 Vegetation Loss

During the construction phase of the proposed project, there is potential for vegetation loss due to vehicle and equipment movements, clearing and excavations with potential for subsequent effects on local wildlife (habitat loss). With the loss of vegetation, surface soils become exposed and the potential for erosion and dust generation increases. As indicated in **Section 3.10.1**, a terrestrial survey was completed as part of the 2008 assessment and concluded that none of the plant and wildlife species observed within the Project Site were considered rare/endangered. Also, during a site visit on December 6, 2012, it was observed that the proposed expansion areas have been previously disturbed and are either covered by gravel or are grassed and are not anticipated to provide wildlife habitat. None of the areas to be disturbed are considered natural.

To minimize the amount of disturbance to vegetation at the Project Site, the following measures will be implemented:

- Construction equipment and vehicle movements will be limited to designated roads/pathways within and around work areas.
- Material stockpiles will be placed in areas approved by the proponent.
- Disturbed/exposed areas will be kept to a minimum with site restoration occurring as soon as practical where required.

The potential effects on vegetation are considered negligible in magnitude considering no native, protected or unique vegetation was encountered during the 2008 assessment and the December 6, 2012 site visit. The residual effects on vegetation are anticipated to be negligible in magnitude, of short term duration, occurring once during the construction phase at the Project Site.

5.8.1.2 Dust Deposition

Potential effects on vegetation may result from dust generation and subsequent dust deposition from vehicle and equipment movement, clearing, excavating, compacting and stockpiling of material at the Project Site. As indicated in **Section 5.8.1.1**, there are no rare/endangered plant or wildlife species within the Project Site and none of the areas to be disturbed are considered natural habitat. To prevent the amount of disturbance to vegetation at the Project Site, the measures identified in **Section 5.8.1.1** will be implemented.

The residual effects on vegetation are anticipated to be negligible in magnitude, of short term duration, occurring intermittently during the construction phase at the Project Site.

5.8.1.3 Noise

As described in **Section 5.3.1.1**, noise will be generated to varying degrees during the construction phase of the proposed project. As the proposed construction areas on the Project Site have previously been disturbed, these areas are not anticipated to provide wildlife habitat. The Project Site consists of activities associated with MH-Industrial Heavy zoning designation and noise will remain consistent with the operations of the facility. It is unlikely that there are noise sensitive species in the area. With the implementation of the mitigation measures presented in **Section 5.3.1.1**, the residual effects on wildlife are anticipated to be negligible in magnitude, of short term duration, occurring intermittently during the construction phase at the Project Site.

5.8.2 Operation

As there is no natural vegetation immediately surrounding each site and the majority of the operation activities at the Project Site will occur in designated areas or indoors, no substantial vegetation effects are anticipated from the operation of the proposed project.

Also, during the operational phase, due to the increase in trucks travelling to/from the Project Site on Provincial Highway No. 16, there is the potential for increased wildlife collisions in the Project Area. However, as identified in **Section 2.7**, there will be approximately 20 additional trucks/day, in addition to the current operations at the Project Site, that travel this major highway which conveys 2,990 vehicles per day according to the 2011 Annual Average Daily Traffic on Provincial Trunk Highways and Provincial Roads. Also, according to the 2008 assessment, there are no rare/endangered wildlife species in the Project Site. As the increase in traffic on the highway is anticipated to be minor, the likelihood of increased wildlife collisions is anticipated to be minor.

5.8.2.1 Noise

As indicated in **Section 5.3.2.2**, noise will be generated to varying degrees during the operation phase at the Project Site; the noise effects on local wildlife are anticipated to be negligible in magnitude to the receptors, of short term duration, occurring intermittently during operation at the Project Site and surrounding Project Area.

5.9 Protected Areas

The construction and operation of the proposed project is not anticipated to affect nearby protected areas. The Whitemud Watershed Wildlife Management Area and the P.F.R.A Community Pasture are located approximately 9 km southeast of the Project Site. Based on the distance to the Project Site, no effects on protected areas are anticipated from the construction and operation of the proposed project.

5.10 Heritage Resources

As indicated in **Section 3.15.1**, as part of the 2008 assessment, the Heritage Resources Branch was contacted to determine the potential impact to heritage resources in the proposed areas of the then-proposed (current) IWWTF. According to the branch records, the potential to impact significant heritage resources was low and the Heritage Resources Branch had no concerns with the proposed project.

As the proposed construction areas have been previously disturbed/developed, it is anticipated that the potential to impact heritage resources is low.

If artifacts, historical features or skeletal remains are encountered during construction, work activities will stop immediately around the affected area with the find reported to the site supervisor. A qualified archaeologist may investigate and assess the find prior to the continuation of work. If skeletal remains are encountered during construction activities, the find will be immediately reported to the site supervisor and the RCMP.

As the proposed alterations at the Project Site will be located on previously disturbed areas and the 2008 assessment indicated that the potential to impact significant heritage resources was low, no historic resources are anticipated to be encountered during construction.

5.11 Aesthetics

5.11.1 Construction/Decommissioning

The aesthetics at the Project Site are not anticipated to significantly change during the construction phase. The zoning of the Project Site and the land immediately surrounding the Project Site is zoned MH-Industrial Heavy as indicated in **Section 3.16.2**. There will be a total of five new structures/building expansions at the Project Site that will be visually similar in construction to the existing structures/buildings.

To maintain a clean, aesthetically pleasing Project Site, the following mitigation measures will be implemented:

- The Project Site will be inspected for loose waste and debris in order to maintain a clean Project Site on a regular basis.
- Waste and debris will be stored in bins and removed on a regular basis from the Project Site.

With the implementation of the above mitigation measures, the potential effects to the Project Site aesthetics are anticipated to be negligible in magnitude, reversible and occurring over the short term intermittently.

5.11.2 Operation

During the operational phase of the proposed project at the Project Site, no additional site disturbances are anticipated to occur. Regular site inspections for loose waste and debris will continue. As a result, no potential effects to the Project Site aesthetics are anticipated to occur.

5.12 Health and Safety

During construction and operation, there is potential for negative effects to worker and Project Site employee safety. Exposure to fuels, moving vehicles, construction equipment and pinch points could all negatively impact worker safety. In Manitoba, worker protection is provided through legislated standards, procedures and training under the *Workplace Safety and Health Act*. All contractors will be subject to site specific health and safety plans for the construction phase of the proposed project. Existing health and safety programs at the facilities will continue to be maintained and updated to accommodate all operational activities at the Project Site. A copy of HyLife Foods and R3 Innovations Inc. health and safety plans can be made available upon request.

The health and safety program will generally include the following and more;

- All construction will be carried out in accordance with the *Workplace Safety and Health Act* to minimize health and safety effects.
- Contractors will adhere to the requirements of applicable health and safety legislation and the site specific safety plan developed by the prime contractor or contractor as appropriate.
- All workers will confirm they have received appropriate training for activities being undertaken.
- All workers will wear appropriate PPE at all times, including hearing protection as required.
- Project Site employees to be kept aware of safety requirements and all on-site works to ensure worker safety.
- Employee training will be provided for the casings and heparin operation at the HyLife Foods facility.

The residual effects to worker safety, if these mitigation measures are employed, are anticipated to be negligible and not significant.

5.13 Accidents and Malfunctions

To prevent accidents and malfunctions, all phases of the proposed project will be conducted in accordance with applicable regulatory requirements. The following sections provide additional details on precautionary measures that are proposed to prevent or mitigate accidents and malfunctions.

Worker protection in Manitoba is provided through standards, procedures and training legislated under the *Workplace Safety and Health Act*. All practices performed on the Project Site will be carried out in accordance with the *Workplace Safety and Health Act*, which will minimize potential effects on health and safety. Safety equipment and personal protective equipment will either be supplied to the employees or be located throughout the facility, where needed.

5.13.1 Spills

During construction and operation, there is potential for environmental effects due to fuel and chemical spills. Accidents (including transportation accidents) could result in the accidental release of hazardous materials and/or equipment fluids. A number of potential environmental concerns are also associated with the accidental release of chemicals and fuels resulting from improper storage and handling procedures. These include effects on soil, vegetation and groundwater quality, degradation of air quality and a potential threat to human health and safety. Activities that may cause a spill are anticipated to occur rarely over the short term during the construction phase of the proposed project. Spills are expected to be predominantly contained to the Project Site. The magnitude of the spill effects are anticipated to range from negligible to moderate depending on the severity of a spill.

To prevent spills from occurring during project activities, the following procedures will be employed:

- All potentially hazardous products (if required on-site) will be stored in a pre-designated, safe and secure product storage area(s) in accordance with applicable legislation.
- Storage and disposal of liquid wastes and filters from equipment maintenance, and any residual material from spill clean-up will be contained in an environmentally safe manner and in accordance with any existing regulations.
- Storage sites will be inspected periodically for compliance with the requirements.

- Refuelling of heavy equipment will adhere to proper procedures such as using a designated area defined by HyLife Foods, with spill kits located at the refueling area, with preference to refuel off-site.
- On-site staff will be trained in how to deal with spills, including knowledge of how to properly deploy site spill kit materials.
- Appropriate type and size of spill kits will be available on-site.
- Service and minor repairs of equipment performed on-site will be performed by trained personnel.
- Any used oils or other hazardous liquids will be collected and disposed of according to provincial requirements.
- Vehicles and equipment will be maintained to minimize leaks. Regular inspections of hydraulic and fuel systems on machinery will be completed on a routine basis, when detected, leaks will be repaired immediately.
- Bedding material and manure collected from the live hog trucks will continue to be land applied annually and stored in accordance with the requirements of the MLMMMR.
- Newly installed pipelines will be tested prior to operation to identify any potential leaks.
- The aeration tank will be regularly inspected visually during operation to prevent tank failures.

Adherence to standard Environmental Management Practices will minimize the risks of accidental spills and adverse effects. This includes regular equipment inspection and maintenance to minimize the risk of fuel spills. Spill reports should be made to Environment Canada and Manitoba Conservation and Water Stewardship. Should a spill occur, measures will be taken immediately with a spill kit or suitable alternative to prevent migration of the spilled material. Recovery measures must also be implemented as necessary in consultation with the appropriate provincial authorities. Following initial response, a remediation program will be undertaken if necessary with contaminated material appropriately managed (in accordance with federal and provincial regulations).

With the implementation of the above mitigation measures as necessary and assuming the implementation of safe work practices, the risk of spills is considered to be appropriately mitigated.

5.13.2 Fire/Explosions

During construction and operation, there exists the potential for fires at the Project Site involving mechanical equipment and fuels. Effects related to fires include, but are not limited to, harm to on-site personnel, equipment, and the potential release of contaminants and hazardous materials.

All precautions necessary must be taken to prevent fire hazards at the Project Site; these include, but are not limited to:

- All flammable waste will be removed on a regular basis and disposed of at an appropriate disposal site.
- Appropriate fire extinguisher(s) will be available on the Project Site. Such equipment will comply with and be maintained to, the manufacturers' standards.
- All on-site fire prevention/response equipment will be checked on a routine basis, in accordance with local fire safety regulations, to ensure the equipment is in proper working order at all times.

- Greasy or oily rags or materials subject to spontaneous combustion will be deposited and stored in appropriate receptacles. This material will be removed from the Project Site on a regular basis and be disposed of at an appropriate waste disposal facility.

With these mitigation measures employed and assuming the implementation of typical safe work practices, the risk of fires and explosions is considered to be appropriately mitigated.

5.13.3 Transportation Accidents

An increase in traffic has the potential to increase the potential for transportation accidents including vehicular collisions and wildlife collisions. Transportation accidents can also result in the release to the environment of vehicle fluids (such as diesel, oils etc.) and the material the vehicles were transporting. Effects related to spills can include air, soil, surface water, and groundwater quality effects with potential for subsequent effects on flora, fauna, aquatic resources and human health.

During construction of the proposed project, it is anticipated that the number of vehicles travelling to/from the Project Site with construction equipment and associated material will be minimal. This potential negligible increase in traffic along Provincial Highway No. 16 is not anticipated to result in a measurable increase in factors leading to transportation accidents.

During the operational phase at the Project Site, a total of approximately 85 trucks/day will be travelling to/from the Project Site as indicated in **Section 2.7**. This is an increase of approximately 20 trucks/day from the current operations at the Project Site. As indicated previously, the A.A.D.T. for Provincial Highway No. 16 west of Provincial Road No. 352 and east of Provincial Highway No. 5, that includes the Project Site, is 2,990 vehicles per day. The additional traffic is considered a minor increase in traffic along Provincial Highway No. 16 and as such, the increase in traffic to the Project Site is not anticipated to substantially increase factors leading to vehicle accidents.

Table 22. Summary of Environmental Effects

6. Public Involvement

Public consultation is an integral part of the environmental assessment process. It provides the opportunity for interested stakeholders to receive information from project planners and, in return, it allows proponents to gain an understanding of public concerns. Public consultation can also provide an opportunity to actively involve stakeholders in the early stages of a project which, in turn, delivers a sense of transparency in the assessment and planning process.

On January 16, 2013, a public Open House was held by AECOM, HyLife Foods and the Town of Neepawa to provide an opportunity to receive and convey information about the proposed changes at HyLife Foods and the R3 IWWTF for all interested parties. To inform the public of this event, an advertisement was placed in the Neepawa Banner on January 4 and 11, 2013 and in the Neepawa Press on January 2 and 9, 2013. The Open House was also advertised on the Town of Neepawa website (www.neepawa.ca). Copies of the advertisements are included in **Appendix C**.

The Open House event was held at the Town of Neepawa Public Library. There were three attendees who participated in the January 16, 2013 Open House. The public was invited to share and express their comments and concerns regarding the project through discussions with representatives from AECOM, HyLife Foods and the Town of Neepawa and by completing a questionnaire. Questionnaires were provided at a final station where the attendees could sit and fill out the form. The questionnaire and Open House presentation materials were also posted on the Town of Neepawa website. A copy of the presentation story boards and questionnaire from the Open House are included in **Appendix C**. No questionnaires were completed by the participants at the Open House or on the Town of Neepawa website. AECOM, HyLife Foods and the Town of Neepawa representatives at the Open House generally observed that the attendees were interested in the project and were either neutral or positive towards the project. Further, the low attendance at the Open House and the lack of questionnaires filled out indicates that there is little public interest in the project.

7. Conclusion

The negative residual environmental effects related to the proposed project were found to be negligible to minor in magnitude post mitigation. HyLife Foods and the Town of Neepawa will comply with the monitoring requirements outlined in the new *Environment Act* Licenses for the pork processing facility and the IWWTF, as required.

Based on the available information, documented assumptions and the implementation of mitigation measures identified in this environmental assessment, no significant environmental effects are anticipated to occur as a result of the proposed alterations at the HyLife Foods pork processing facility and the IWWTF.

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Figures

Appendix A

Pharmer Engineering Report

Appendix B

Greenhouse Gas Emissions

Appendix C

Open House Material