

**MAPLE LEAF FOODS INC.
NOTICE OF ALTERATION PURSUANT TO THE
ENVIRONMENT ACT FOR THE BRANDON HOG
PROCESSING PLANT TO ACCOMMODATE A HOG
PROCESSING RATE OF 75,000 HOGS PER WEEK**

Prepared For

**MAPLE LEAF FOODS INC.
Ms. Anne Tennier, P. Eng.
5063 North Service Road
Box 5091
Burlington ON L7R 4R3**

Submitted By

ND LEA Inc.

November 2006

41549.400



ND LEA Inc.
Suite 111-93 Lombard Avenue
Winnipeg, MB, Canada R3B 3B1
Phone: (204) 943-3178
Fax: (204) 943-4948
www.ndlea.com

November 1, 2006

Ref. No. 41549.400

Ms. Tracey Braun, M.Sc.
Director, Environmental Assessment & Licencing Branch
Manitoba Conservation
123 Main Street, Suite 160
Winnipeg MB R3C 1A5

Dear Ms. Braun:

Re: Notice of Alteration to Accommodate a 75,000 Hogs Per Week Processing Rate at the Brandon Hog Processing Plant

On behalf of Maple Leaf Foods Inc., please find enclosed two copies of a Notice of Alteration (NoA) in accordance with Section 14 (1)(a) of *The Environment Act* to accommodate a 75,000 hogs per week processing rate at the Brandon hog processing plant.

The alterations required are mainly related to provision of additional building capacity to accommodate the increased processing rate. In addition wastewater pretreatment improvements will be incorporated to maintain the current level of nutrient input to the City of Brandon industrial wastewater treatment facility. In our view, the potential environmental effects associated with the alterations are insignificant and the alteration should be considered minor pursuant to Section 14 (2)(b) of *The Environment Act*.

Maple Leaf Foods would like to have the ability to install building footings and foundations in 2006 prior to the onset of adverse winter weather conditions. Accordingly, Maple Leaf Foods would request an early consideration and approval of this NoA, or a staged approval, for the building footings and foundations.

Also, as noted in this NoA, the information related to the internal processing plant changes and the layout drawing is considered **proprietary** by Maple Leaf Foods. Accordingly, that information should be protected pursuant to section 47 of *The Environment Act*.

Should you require any further information or clarification on this NoA, please do not hesitate to contact me at 272-2019 or Ms. Anne Tennier at (905) 319-5718.

Yours sincerely,

ND LEA Inc.

Larry Strachan, P.Eng.
Senior Project Manager

c Ms. Anne Tennier, P. Eng., Maple Leaf Foods
Mr. Ted Snure, P.Eng, City of Brandon
Earth Tech Consultants

ls/dt

Maple Leaf Foods Inc.

Notice Of Alteration Pursuant To The Environment Act For The Brandon Hog Processing Plant To Accommodate A
Hog Processing Rate Of 75,000 Hogs Per Week

November 2006

STANDARD LIMITATIONS

This report was prepared by ND LEA Inc. (ND LEA) for the account of Maple Leaf Foods Inc. (the Client). The disclosure of any information contained in this report is the sole responsibility of the Client. The material in this report reflects ND LEA's best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. ND LEA accepts no responsibility for damages, if any, suffered by a third party as a result of decisions made or actions based on this report.

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1.0 INTRODUCTION

Maple Leaf Foods Inc. operates a hog processing plant in the City of Brandon. Although the plant is currently licenced under Manitoba Environment Act Licence for a two shift operation, the processing rate is restricted to a one shift rate of 54,000 hogs per week as wastewater treatment provided by the City of Brandon can only accommodate the one shift processing rate.

A Notice of Alteration (NoA) by Maple Leaf Foods Inc. and a Proposal from the City of Brandon for a second shift processing rate of 108,000 hogs per week and increased wastewater treatment were submitted to Manitoba Conservation in March 2003. The NoA and Proposal have been reviewed by Manitoba Conservation and the Manitoba Clean Environment Commission, but an approval decision has not yet been issued.

Maple Leaf Foods Inc. would now propose to proceed with an increased processing rate at the Brandon plant in steps, with the first step being to increase the processing rate to 75,000 hogs per week.

To accommodate the increased hog processing rate, building capacity increases and improved wastewater pre-treatment are required.

Accordingly, this NoA is filed for consideration of Manitoba Conservation. The NoA outlines the alterations proposed for a 75,000 hogs per week processing rate, how they differ from the March 2003 NoA, and provides an evaluation of the potential environmental effects of the changes requested. This NoA also outlines how Maple Leaf Foods Inc. will address the recommendations arising from the 2003 Clean Environment Commission hearings that specifically pertain to the hog processing plant.

The City of Brandon will be filing a NoA to their March 2003 Proposal to provide the additional wastewater treatment for the increased processing rate.

Maple Leaf Foods Inc. would also like the ability to proceed with building footings and foundations in 2006 prior to onset of adverse weather conditions.

2.0 ALTERATIONS PROPOSED FOR A 75,000 HOGS PER WEEK PROCESSING RATE AS COMPARED TO THE MARCH 2003 ALTERATIONS

Drawing No. LayoutR3 (*Note: Drawing not included as is considered proprietary information*) in Appendix A attached, outlines the plant footprint changes for the building alterations to accommodate a 75,000 hogs per week processing rate.

Table 1 below outlines the differences in the alterations now proposed as compared to those identified in the March 2003 Notice of Alteration.

Table 1 – Proposed November 2006 Alterations as Compared to March 2003 Alterations (differences are highlighted)

Plant Area	March 2003 Alterations	November 2006 Alterations
1. Holding Pen Expansion	<ul style="list-style-type: none"> • 43,343 ft² expansion • new manure pad • new dead hog bin and area • new east and west ditches • new access road • upgrading 675 metres of 65th St. E. • move portion of 25kV line, relocate light poles, relocate fire loop, fill in ditch, move fence 	<ul style="list-style-type: none"> • 43,343 ft² expansion • new manure pad • [REDACTED] • new east and west ditches • [REDACTED] • [REDACTED] • move portion of 25kV line, relocate light poles, relocate fire loop, fill in ditch, move fence
2. Cooler Area	<ul style="list-style-type: none"> • 48,348 ft² expansion • relocate fence line • relocate fire loop • modify ditch 	<ul style="list-style-type: none"> • [REDACTED] • [REDACTED] • relocate fire loop • modify ditch
3. Carcass Load-Out Area	<ul style="list-style-type: none"> • temporary, then final relocation • road change with turn around area 	<ul style="list-style-type: none"> • temporary, then final relocation • road change with turn around area
4. Shipping Area	<ul style="list-style-type: none"> • 50% increase in floor area • 10 additional shipping bays • move fence line, ditch, fire loop, process waste line, sanitary waste line, water line 	<ul style="list-style-type: none"> • 50% increase in floor area • 10 additional shipping bays • move fence line, ditch, fire loop, process waste line, sanitary waste line, water line
5. Freezer Area	<ul style="list-style-type: none"> • 20,062 ft² expansion 	<ul style="list-style-type: none"> • 20,062 ft² expansion

Plant Area	March 2003 Alterations	November 2006 Alterations
6. Other Internal/External Alterations	<ul style="list-style-type: none"> • relocate engineering and production office • additional purchasing area storage • one additional 36,320L blood tank • approval for portion of inedible renderable waste to be disposed of at landfill or composting facility 	<ul style="list-style-type: none"> • relocate engineering and production office • [REDACTED] • one additional 36,320L blood tank • approval for portion of inedible renderable waste to be disposed of at landfill or composting facility
7. Wastewater Pretreatment	<ul style="list-style-type: none"> • isolate 3rd wet pit and use as backup • pump wet pit liquids to a common header • underflow from screens to distribution hopper then to DAFs • replace rotary screens with screen presses • install staircase to replace ladder for screen/centrifuge inspection & maintenance • minor operational changes to DAFs • new skimming pumps • improve sanitation in building • construct new electrical room, upgrade logic control system • install communication cable to powerhouse 	<ul style="list-style-type: none"> • [REDACTED]

In summary, alterations now proposed that are different from the March 2003 NoA are as follows:

- A trailer at the manure pad for dead hog storage rather than a dead hog bin at the holding pen area of the plant
- No new access road to the holding pen area or upgrading of 65th St. E.
- A smaller cooler expansion and no fence relocation in the cooler area
- No additional purchasing area storage
- New alteration plans for the wastewater pretreatment building

3.0 NEW ALTERATIONS PROPOSED NOT ADDRESSED IN THE MARCH 2003 NOA

Dead Hog Trailer

An enclosed truck trailer at the manure pad will be provided for storage of dead hogs. The dead hogs will be disposed of at a rendering facility on a regular basis.

Utility Building

The utility building will be expanded by 2,400 ft² to house three new compressors.

Internal Processing Plant Alterations

Note: Information not included as is considered proprietary

Other New Alterations

Two new worker lockers rooms with showers and uniform washers/dryers will be installed.

Wastewater Pretreatment

The detailed alterations to the wastewater pretreatment at the hog processing plant are outlined in the HDR ONE Company | *Many Solutions* report contained in Appendix B of this NoA. In summary, the following alterations will occur:

- Drum Screen No.1 will be replaced by a FAN Press Screw Separator screen
- Ferric chloride solution (or alternate chemicals such as ferric sulphate, acidulation, or a tri-polymer) will be metered into the discharge from the FAN Press Screw Separator screen
- DAF#1 will be chemically treated to reduce nitrogen and phosphorus loadings to the City of Brandon industrial wastewater treatment facility
- A new 1200 ft² corrosion-resistant building will be located south of the pretreatment building to house the chemical feed facilities
- Two new stainless steel or glass lined carbon steel skimmings storage tanks will be installed
- Three progressing cavity pumps will be relocated
- New air-operated double diaphragm pumps will replace the cavity pumps

- A second centrifuge with backdrive will be installed
- The existing dry polymer make-up unit will be relocated to the chemical feed facilities building
- An additional chemical polymer metering pump will be installed
- A new magnetic flow meter will be installed
- Valving and piping necessary to ensure flexibility among the 3 DAFs to accommodate cleaning and other maintenance activities will be installed

Disposal of DAF Skimmings

Approval is requested for disposal of chemical skimmings at a licenced landfill or composting facility as they cannot be rendered. In addition flexibility is requested to dispose of non-chemical skimmings through either rendering (if CFIA chemical is available and achieves the same or better dewatering performance as the non-CFIA chemical) or at a licenced landfill or composting facility. This issue is related to the prohibition of rendering skimmings dewatered with non-CFIA approved chemicals, product quality, and operational issues including odour during rendering. Chemical pretreatment is not anticipated to continue once the City of Brandon completes its proposed centralized treatment facility.

Removal of Flow and Pollutant Loading Limits

Clauses 13(b) and 13(c) of Environment Act Licence No. 2311 S2R specify maximum daily and weekly flow rates, and maximum daily and weekly pollutant loading limits. Maple Leaf Foods requests that these Licence limits be eliminated from future licences, and be replaced with a requirement to enter into an Industrial Use Agreement with the City of Brandon.

4.0 POTENTIAL ENVIRONMENTAL EFFECTS OF NOVEMBER 2006 PROPOSED ALTERATIONS

The potential environmental effects that occur from the operation of the hog processing plant for a two shift operation, and the mitigation of those effects, have been addressed in the May 1999 Environment Act Proposal and supporting documentation. The alterations to the existing plant proposed in this NoA are taking place in already disturbed areas and the effects are mainly related to short term construction activities. The alterations proposed to the wastewater pretreatment plant will maintain the current nutrient quality of the effluent being discharged to the City of Brandon industrial wastewater treatment facility at the increased hog processing rate. A subjective evaluation of the potential environmental effects of the proposed alterations is as follows:

Dead Hog Trailer Storage

Potential environment effects will be related to aesthetics and odour and are considered to be insignificant.

No new holding pen access road or upgrading of 65th St. E.

No environmental effect.

Smaller Cooler Expansion and no Fence Relocation

Potential environmental effects will be related to construction activity and associated minor and short-term effects related to dust and noise and are considered to be insignificant. Potential risk associated with an increased amount of ammonia for the refrigeration system will be present. An emergency response plan for addressing an ammonia leak is in place.

No additional Purchasing Area Storage

No potential environmental effect.

Utility Building

Potential environmental effects will be related to building expansion construction activity and associated minor and short-term effects related to dust and noise. These effects are considered to be insignificant. Potential environmental effects related to the operation of the three additional compressors are considered to be minor.

Internal Processing Plant Alterations

Note: Information not included as is considered proprietary.

New Worker Locker Rooms, Washers & Dryers

No potential environmental effect.

Wastewater Pretreatment

Potential environmental effects of the alterations to the wastewater pretreatment relate to the use and storage of chemicals, the disposal of DAF skimmings and wastewater quality to the City of Brandon industrial wastewater treatment facility. Chemical storage and feed facilities will be located in a new corrosion resistant building with appropriate containment and spill clean-up provisions, equipment and procedures in place. Potential environmental effects with good operating practices are considered to be minor.

The amount of skimmings to be disposed of is estimated to be about 9,000 tonnes per year (4,000 chemical, 5,000 non-chemical). Disposal of skimmings by rendering or to a licensed landfill or composting facility is considered to be insignificant. The nutrient (TKN and P) quality of wastewater pretreatment effluent with the increased processing rate will be maintained at about the same concentration levels as are experienced now with the first shift operation (see Summary Table 1 on page 7 – refer to Appendix B for more detailed discussion of expected pretreatment waste load projections). The final effluent quality from the City of Brandon industrial wastewater treatment facility is predicted to have no net increase in nitrogen and a concentration of 1.0 mg/l phosphorus.

Other plant wastewater pollutant concentrations and the amount of sanitary wastewater will increase due to the increased hog processing rate and the number of workers at the plant. With the chemical pretreatment and additional final wastewater treatment to be provided by the City of Brandon the potential environmental effect is considered to be neutral. Table II in Appendix B provides the projected sanitary waste loads for the expanded hog processing plant.

Summary Table 1 – Wastewater Loadings

Parameter	Total Loads with Chemical Pretreatment in One DAF		Actual Loadings 10/1/04 – 5/31/06
Flow			
Weekly Average	38,250 m ³ /wk		23,294 m ³ /wk
Daily Maximum	7,676 m ³ /day		5,196 m ³ /day
CBOD			
Weekly Average	39,688 kg/wk	1038 mg/l	25,412 kg/wk
Daily Maximum	8,922 kg/day	1162 mg/l	12,921 kg/day
COD			
Weekly Average	82,944 kg/wk	2168 mg/l	55,047 kg/wk
Daily Maximum	17,543 kg/day	2286 mg/l	26,258 kg/day
TSS			
Weekly Average	21,775 kg/wk	569 mg/l	13,568 kg/wk
Daily Maximum	4,525 kg/day	590 mg/l	6,867 kg/day
TKN			
Weekly Average	8,089 kg/wk	211 mg/l	4,796 kg/wk
Daily Maximum	1,686 kg/day	220 mg/l	2,042 kg/day
Oil & Grease			
Weekly Average	13,383 kg/wk	350 mg/l	5,765* kg/wk
Daily Maximum	2,162 kg/day	282 mg/l	3,524* kg/day
Total Phosphorous			
Weekly Average	1,020 kg/wk	26.7 mg/l	579 kg/wk
Daily Maximum	193 kg/day	25 mg/l	330 kg/day

Source: HDR Engineering Inc., 2006

* Oil & Grease values omit one "outlier"

5.0 SUMMARY OF ALTERATIONS REQUESTED IN THIS NOA

The following list summarizes the proposed alterations for this development:

- Holding Pen Expansion
- New Manure Pad
- Trailer at Manure Pad for dead storage
- Cooler Expansion
- Carcass Load-out area Relocation
- Shipping area increase
- Freezer Expansion
- Utility Building Expansion
- New Blood Tank
- Internal plant processing changes: *Note: Information not included as is considered proprietary.*
- Wastewater Pretreatment Expansion and Upgrade
- Disposal of skimmings at Rendering, Landfill or Composting Facility
- Replacement of flow and pollutant loading rates with an Industrial Use Agreement
- Ability for 2006 Construction
- Miscellaneous ditching, piping, office relocations related to building changes

6.0 2003 CLEAN ENVIRONMENT COMMISSION RECOMMENDATIONS

Subsequent to the public hearings held in June and July 2003, to consider the City of Brandon industrial wastewater treatment facility expansion and Maple Leaf Foods' hog processing plant alteration, the Manitoba Clean Environment Commission issued its report and recommendations in October 2003. Several of these recommendations were specifically directed to the hog processing plant. This section identifies how Maple Leaf Foods is incorporating these recommendations into its operations.

Recommendations 1, 2, 3, 8, 10, 11, 12 and 13 are directed to either the City of Brandon, or Manitoba Conservation, and therefore are not discussed in this NoA. Recommendations 4, 5, 6, 7, and 9 are directed jointly to Maple Leaf Foods and the City of Brandon. This NoA addresses solely Maple Leaf Foods' approach – the City of Brandon will be addressing its response to the recommendations in the NoA filed separately to address wastewater treatment alterations required to accommodate 75,000 hogs per week.

Recommendation 4 - Maple Leaf Foods and the City of Brandon should be required to immediately begin development and implementation of ISO 14001-certified Environmental Management Systems for their respective hog processing and industrial wastewater treatment facilities, and complete their Environmental Management Systems by December 2005.

Maple Leaf Foods' Brandon operations currently has many elements of an environmental management system (EMS) in place at the plant, and will continue to develop an EMS that is appropriate to its operations and activities. It does, however, believe that pursuit of certification under ISO 14001 or any other recognized certification program should be driven by business requirements and not mandated in a license. Timing for completion of the EMS will be determined through discussion with Manitoba Conservation.

Recommendation 5 - Maple Leaf Foods should be required to establish Environmental Management Systems consistent with the ISO 14001 Standard for hog production operations under its control by December 2005 and should encourage Environmental Management Systems for its suppliers.

Maple Leaf Foods believes that this recommendation goes beyond the scope of a processing plant license, and should not be addressed as part of this licensing initiative.

Recommendation 6 - Within 12 months of receiving Environment Act Licenses, both Maple Leaf Foods and the City of Brandon should be required to complete water audits of their respective hog processing and industrial wastewater treatment facilities, and prepare water conservation plans with strategies and targets for reducing water use.

Maple Leaf Foods started a water conservation program at the Brandon plant approximately two years ago and will continue these efforts through this licensing initiative. As a cautionary note, food safety is of prime importance in a food processing plant, and water usage can be critical to HACCP (Hazard Analysis and Critical Control Point) programs, which is the food industry's food safety certification program which is focused on increasing food safety and decreasing the risk of food-borne illness. Maple Leaf Foods clearly wants to minimize water consumption, but each water reduction project must be evaluated on its effect on HACCP requirements to ensure food safety is not inadvertently compromised.

Recommendation 7 - Maple Leaf Foods and the City of Brandon should be required to conduct quarterly groundwater monitoring at high risk locations adjacent to their respective hog processing and industrial wastewater treatment facilities.

Maple Leaf Foods and the City of Brandon currently conduct a semi-annual groundwater monitoring program at strategic locations on both properties, as well as at the nearest residential well. This program was reduced from quarterly

monitoring frequency to semi annual with approval from Manitoba Conservation, as no groundwater contamination trends had been detected. Maple Leaf Foods will continue the groundwater monitoring program, adjusting as required to accommodate construction on the site.

Recommendation 9 – Within 12 months of receiving Environment Act Licenses, both Maple Leaf Foods and the City of Brandon should be required to complete greenhouse gas inventories of their respective hog processing and industrial wastewater treatment facilities and prepare greenhouse gas management plans with reduction strategies and targets.

Maple Leaf Foods' Brandon operations have been among the leaders within Maple Leaf Foods plants in terms of energy conservation. In fact, MLF Brandon was awarded the Maple Leaf Energy Innovators Award for 2005, in recognition of its efforts in reducing energy intensity, demonstrating organizational commitment to energy reduction and implementing management and monitoring processes. Energy conservation is a key contributor to reducing greenhouse gases. These efforts will continue through this licensing initiative, with energy saving opportunities being incorporated into the expansion to the extent possible. Maple Leaf Foods has an active energy conservation program to reduce energy consumption across the company, and these efforts will continue in an expanded operation.

**DRAWING NO.
LAYOUT 3**

APPENDIX A

**HDR PROJECT
NO. 19774-134-001**

APPENDIX B

MAPLE LEAF FOODS INC. - BRANDON, MB

**PARTIAL CHEMICAL PRETREATMENT FOR 75,000 HOGS/WK
PLUS NEW SCREEN AND DECANTER CENTRIFUGE**

Manitoba license no. 23599
Expires "July 31, 2007"



Nebraska license no. E-4370
Expires "December 31, 2006"

PREPARED BY:



**HDR ENGINEERING, INC.
8404 INDIAN HILLS DRIVE
OMAHA, NE 68114-4049**

HDR PROJECT NO. 19774-134-001

OCTOBER 31, 2006

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MAPLE LEAF FOODS INC. - BRANDON, MB

**PARTIAL CHEMICAL PRETREATMENT FOR 75,000 HOGS/WK PLUS
NEW SCREEN AND DECANTER CENTRIFUGE**

I. INTRODUCTION

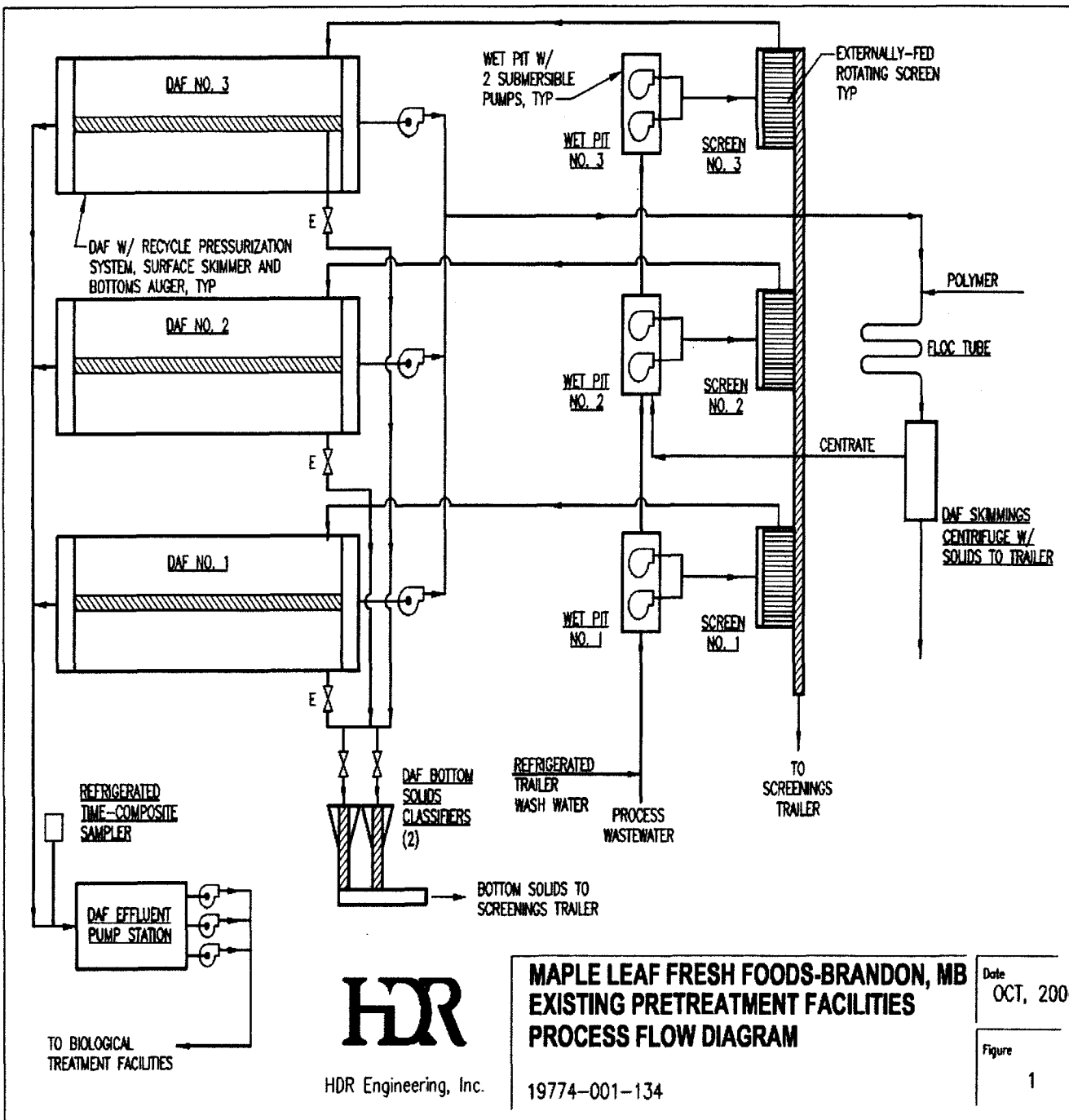
Maple Leaf Fresh Foods wants to increase production at its Brandon, MB plant, which is currently permitted for 54,000 hogs/wk. This production increase is projected to reach a maximum of 75,000 hogs/wk as early as June 30, 2007. To accommodate the additional load from increased production, the City of Brandon (COB) will complete construction of Phase 1 of its expansion of the Industrial Wastewater Treatment Facility (IWWTF) in the early summer of 2007. It is anticipated that the effluent to the Assiniboine River from the Phase 1 IWWTF expansion will be required to meet a requirement of “no net increase in nitrogen”, as well as a new phosphorus limit of 1.0 mg/l. Therefore to assist the COB in meeting these limits, MLFF will chemically pre-treat part of its effluent until the IWWTF is fully expanded in Phase 2 to treat the combined flows from the COB, Wyeth and MLFF.

II. EXISTING PRETREATMENT FACILITIES

Wastewater from the packing plant flows by gravity to the pretreatment building where it enters three separate wet pits in series. See Figure No. 1. The raw wastewater is pumped with two submersible pumps in each wet pit. The pump controls utilize bubbler-type level sensors in each wet pit to activate pumps in that wet pit. Alternation of the lead pump is done manually. The two pumps in each wet pit only supply wastewater to one of the three externally-fed rotating screens located on an elevated platform above the wet pits. The screens are equipped with 1.0-mm openings for recovery of coarse solids. The screenings are directed into a trailer and hauled to Winnipeg for rendering.

After screening wastes flow by gravity to three, parallel dissolved air flotation (DAF) systems for recovery of grease and fine solids. Each DAF unit can only receive flow from one of the rotating screens.

C:\SNEED\MAPLE-LEAF\FIGNO1.DWG, Layout1, 10/10/2006 1:34:51 PM, cqueen



HDR Engineering, Inc.

**MAPLE LEAF FRESH FOODS-BRANDON, MB
EXISTING PRETREATMENT FACILITIES
PROCESS FLOW DIAGRAM**

19774-001-134

Date
OCT, 2006

Figure

1

The above-grade, rectangular stainless steel DAF units are each equipped with high-pressure recycle pressurization systems. Each DAF tank has effective surface dimensions of 14.3 m long by 3.0 m wide (approx. 46.92 ft x 9.84 ft). Bottoms solids are augered to the influent end of each DAF tank where they are periodically blown down to a pair of stainless steel classifiers by a time clock-activated electric valve on each DAF. Heavy solids from each classifier are discharged to a screw conveyor that deposits them on a belt conveyor that dumps this material into the screenings trailer for hauling to Winnipeg for rendering.

Material floating on the surface of each DAF is skimmed with a chain and flight mechanism into a small hopper at the influent end of each DAF tank. A level sensor in each skimmings hopper turns the skimmers on or off, depending on the skimmings level in the hopper. DAF skimmings are pumped with progressing-cavity pumps, equipped with VFDs, to a flocculation tube (also called "floc tube" or "windings") on the elevated platform near the rotary screens. A polymer solution is made up on the platform by mixing water and a dry cationic polymer in a polymer makeup unit. This polymer solution is metered into the DAF skimmings as they enter the windings to flocculate the solids before they enter a Peralisi decanter centrifuge with a back drive. Centrate is discharged back into the middle wet pit, while the solids are discharged into a trailer and hauled to Winnipeg for rendering, or landfilling if the material does not meet the renderer's requirements.

After screening and flotation, the pretreated wastewater flows by gravity to a large, below-grade wet pit. A Sigma - 9000 refrigerated sampler is available to collect time-composited samples of the influent into the wet pit. Three Gorman Rupp T-8 pumps are available to pump the wastewater from this below-grade pit to the City of Brandon's biological wastewater treatment facilities that serve the Maple Leaf plant. Steam can be injected into the wastewater during production days as necessary to maintain the required 28° C wastewater temperature in the effluent from the anaerobic lagoon at the City's treatment system. The amount of steam injected into this wet pit is regulated manually.

III. PARTIAL CHEMICAL PRETREATMENT PLUS NEW SCREEN, DECANTER CENTRIFUGE, AND APPURTENANCES

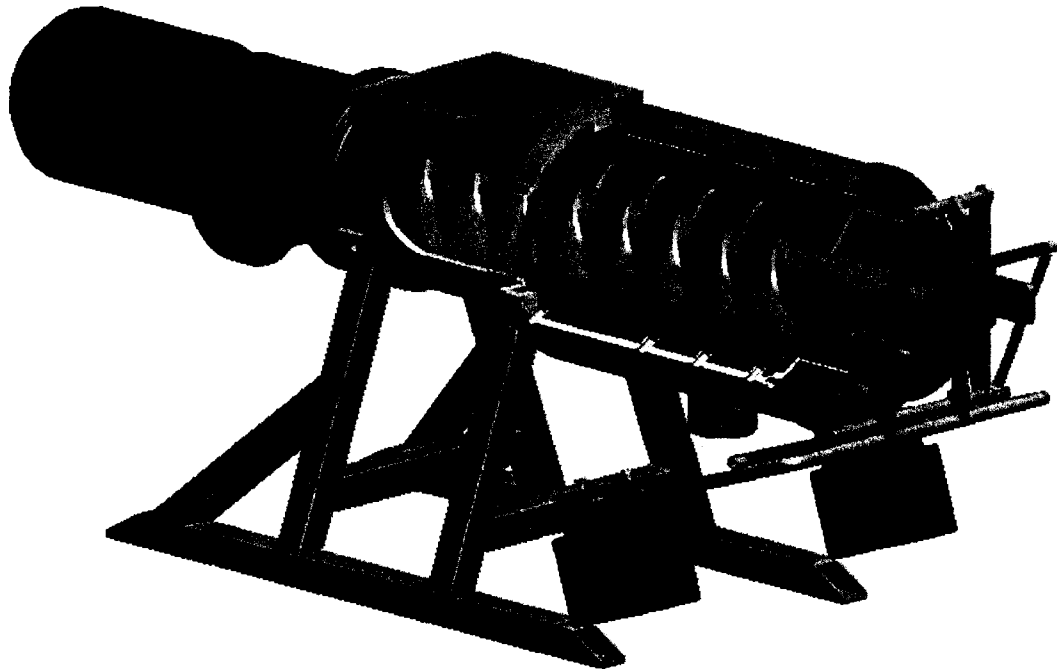
The following steps are planned to: 1) reduce waste loads discharged to the IWWTF below the treatment capacity of the current facilities, 2) reduce influent nutrients as necessary so that the treated effluent from the IWWTF will result in “no net increase in nitrogen” and 1 mg/l phosphorus discharged to the Assiniboine River, and 3) provide for improved redundancy in the pretreatment facilities. To reduce waste loads to the IWWTF, it will be necessary to chemically pretreat part of the wastewater.

Ferric chloride addition ahead of DAF is very effective in improving pretreatment removals, particularly for nutrients, in meat packing wastewater due to the affinity of the ferric for blood and other proteinaceous materials. However it is not necessary to chemically pretreat all the wastewater to achieve the necessary waste load reductions. Due to the configuration of the three existing influent lift stations in series, the flow pumped to Screen No. 1 and DAF No. 1 contains more solids and blood, while flow to the Screen No. 3 contains more fat. Therefore the flow entering the first DAF will normally be chemically pretreated since this will accomplish the maximum waste load reduction with the minimum chemical addition. To further maximize waste reduction, the centrate from the two skimmings dewatering centrifuges will normally be directed back to the Wet Pit No. 1, rather than the current Wet Pit No. 2. However Maple Leaf routinely takes each DAF out of service for cleaning and maintenance. Therefore to allow continued partial chemical pretreatment when the first DAF is out of service, piping provisions will be included to allow temporary feeding of chemicals to the second DAF and directing of centrate to this DAF.

Although ferric chloride will probably be used; chemical pretreatment could similarly be accomplished with ferric sulfate, acidulation, or a tri-polymer feeding scheme.

A. Screening Improvements

Screen No. 1 will be replaced with a new FAN Press Screw Separator (PSS) screen with 0.5-mm openings. See drawing of FAN PSS below. The FAN Separator works



FAN Press Screw Separator

differently from the present rotary drum screens by using the screened material to act as a “precoat” on the FAN’s wedge wire screen and thereby removes material even finer than the FAN screen openings. Therefore more solids will be removed by the FAN screen for rendering and less solids removed at the DAF. As shown in the picture below, the FAN press screw separator also squeezes on the “plug” of screenings so they are considerably drier than screenings from the present rotary drum screens, which is advantageous for rendering. Increased removal of coarse solids is also expected to improve the effectiveness of chemical pre-treatment, as the chemical will not be bound up with coarser solids in the DAF.

A new drum screen has been ordered for the existing drum screen to improve screening until the FAN screen can be installed. Once the FAN unit is installed, the existing rotary screen with its new drum screen will serve as a standby unit for the other screens.



Picture of FAN Press Screw Separator Showing the “Plug” of Screened Material

B. Chemical Feed Facilities

Ferric chloride solution (or alternate chemicals) will be pumped with metering pumps (1 duty + 1 uninstalled spare) from Totes into the discharge from the FAN Press Screw Separator. The dosage rate will be regulated by a controller based on a pH sensor located near the influent to the DAF. The ferric chloride solution is acidic and it is anticipated that it will be necessary to lower the pH of the wastewater to around 5.7-5.9 to achieve good coagulation of the proteins by the ferric. To then flocculate the fine coagulated particles, an anionic polymer will be added just before the DAF. This polymer will be fed from drums with a liquid polymer feed system (1 duty + 1 uninstalled spare) that automatically dilutes it with water. The polymer feed rate will be regulated by a new magnetic flow meter located on the DAF influent piping.

The new chemical feed facilities will be housed in a new corrosion-resistant building, probably located on the south side of the existing pretreatment building.

C. Skimmings Handling Improvements

Currently there is only minimal storage in the skimmings hoppers at the influent ends of the DAF tanks. When these hoppers fill up, the skimmer is shut off and the skimmings are left on the surface of the DAF. To improve this practice, two new skimmings storage tanks will be provided in the new pretreatment building addition. These tanks will each hold approximately 45 m³ and will either be constructed of stainless steel or glass-lined carbon steel. Each tank will be equipped with a submersible mixer, a level sensor and a high-water overflow line. Typically one tank will receive ferric-treated skimmings from the first DAF, while the other will receive the regular skimmings from the two other DAFs.

The three progressing cavity pumps that currently pump skimmings from the DAF hoppers to the centrifuge will be relocated to pump the skimmings from these new skimmings tanks to the centrifuges for dewatering. New air-operated, double-diaphragm pumps will replace these pumps for pumping the skimmings from the DAFs to the new skimmings holding tanks.

D. Skimmings Dewatering Improvements

Increased production, plus partial chemical pretreatment, will significantly increase the amount of DAF skimmings that require dewatering. Therefore a second centrifuge with backdrive will be installed on an expanded access platform south of the existing centrifuge. Typically chemical skimmings will be dewatered with one centrifuge and regular skimmings with the other.

Dewatered chemical skimmings will definitely have to be disposed of by landfilling or composting, as renderers cannot accept skimmings that have been treated with ferric chloride. However with the use of new CFIA-approved polymers, it may be possible to combine the dewatered regular skimmings with the screenings for rendering. If the renderer still cannot accept the dewatered skimmings due to their impact on the finished product quality, these skimmings will be landfilled or composted.

The existing dry polymer make-up unit will be relocated to the new pretreatment building addition from its present location on the elevated access platform. An additional chemical polymer metering pump will be provided which will result in two duty pumps plus one standby. Polymer solution will be metered into the skimmings being pumped to the new centrifuge based on flow measured by a new magnetic flow meter installed on this line.

IV. PRETREATED WASTE LOAD PROJECTIONS

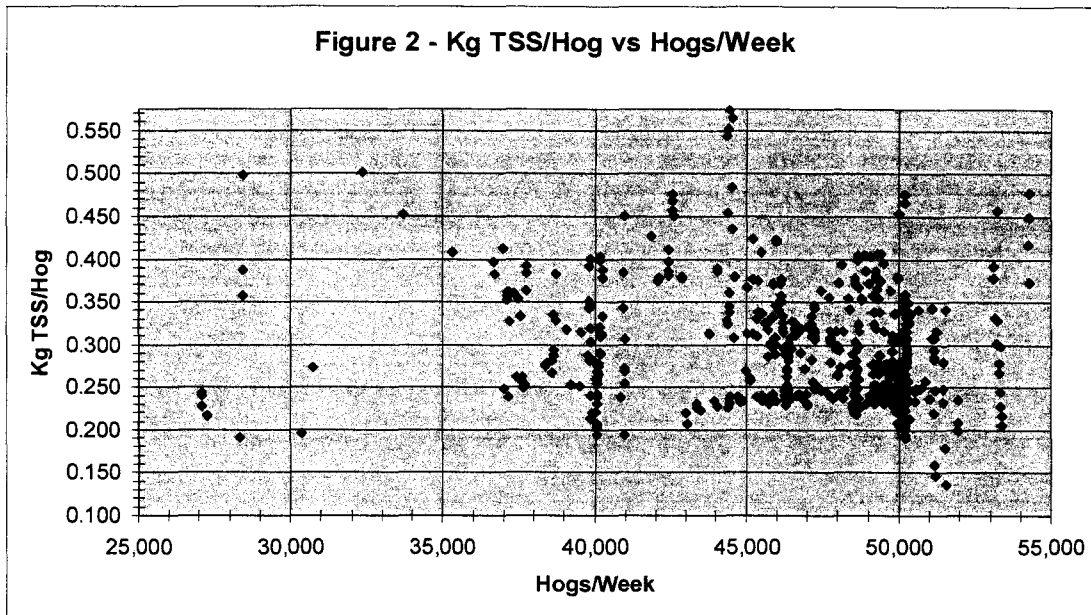
To determine the projected waste loads resulting from partial chemical pre-treatment of wastewater from 75,000 hogs/week, the actual pre-treatment plant performance was evaluated for the period of Oct. 1, 2004 to May 31, 2006. Columns E, F and G in Table I show: 1) projected process waste loads for 75,000 hogs/wk, assuming ferric addition in one DAF; 2) present limits for Maple Leaf's discharge to COB; and 3) average weekly and the maximum daily waste loadings from October 1, 2004 through May 31, 2006. To derive the projected waste loads, daily waste loads per hog were plotted for each parameter (e.g. BOD, TSS, TKN, etc) against daily hog numbers and a "high side" value was selected from values during production rates higher than 9,900 hogs/day, after disregarding "outliers". Similarly weekly waste loads per hog were plotted against weekly hog numbers and a "high side" value was selected from values during production rates higher than 48,000 hogs/wk, after disregarding "outliers". An estimated 95-98 percent of the measured loads are below these "high side" values, which thus represent conservative design values. To illustrate this process, see Figure No. 2 below where a value of 0.41 kg TSS/Hog was selected. This value was then multiplied by the design weekly production of 75,000 hogs/wk to yield a value of 30,750 kg/wk. This value is shown in Column B in Table I and would become the design weekly TSS value if no chemical pretreatment was planned. However, this number is then adjusted to reflect additional TSS removals through one of the three DAFs due to chemical addition using ferric chloride. These values are shown in Column D, while column C shows the projected load from pre-treatment in the remaining two non-chemical DAFs. The sum of Columns C and D yields the total projected process waste loads for 75,000 hogs/wk with chemical pretreatment in one DAF. This process is replicated for each one of the parameters in Table 1.

TABLE I - WASTEWATER LOADINGS

(10/18/2006)

<u>Column A</u>		<u>Column B</u>	<u>Column C</u>	<u>Column D</u>	<u>Column E</u>	<u>Column F</u>	<u>Column G</u>
		Projected Waste Loads w/o Chemical Pretreatment	Loads from Two DAFs w/o Chemical Pretreatment	Loads from One DAF with Chemical Pretreatment	Total Loads with Chemical Pretreatment in One DAF	Present Limits	Actual Loadings 10/1/04 - 5/31/06
Flow							
Weekly Average =	0.51 m ³ /hog x 75,000 hogs/wk =	38,250 m ³ /wk	25,500 m ³ /wk	12,750 m ³ /wk	38,250 m ³ /wk	31,200 m ³ /wk	23,294 m ³ /wk
Daily Maximum =	0.51 m ³ /hog x 15,050 hogs/day =	7,676 m ³ /day	5,117 m ³ /day	2,559 m ³ /day	7,676 m ³ /day	5,725 m ³ /day	5,196 m ³ /day
CBOD₅							
Weekly Average =	0.73 kg/hog x 75,000 hogs/wk =	54,750 kg/wk (1431 mg/l)	36,500 kg/wk (1431 mg/l)	3188 kg/wk (250 mg/l)	39,688 kg/wk (1038 mg/l)	59,280 kg/wk	25,412 kg/wk
Daily Maximum =	0.8 kg/hog x 15,050 hogs/day =	12,040 kg/day (1569 mg/l)	8,027 kg/day (1569 mg/l)	895 kg/day (350 mg/l)	8,922 kg/day (1162 mg/l)	13,901 kg/day	12,921 kg/day
COD							
Weekly Average =	1.525 kg/hog x 75,000 hogs/wk =	114,375 kg/wk (2990 mg/l)	76,250 kg/wk (2990 mg/l)	6694 kg/wk (525 mg/l)	82,944 kg/wk (2168 mg/l)	N/A	55,047 kg/wk
Daily Maximum =	1.57 kg/hog x 15,050 hogs/day =	23,629 kg/day (3078 mg/l)	15,752 kg/day (3078 mg/l)	1791 kg/day (700 mg/l)	17,543 kg/day (2286 mg/l)	N/A	26,258 kg/day
TSS							
Weekly Average =	0.41 kg/hog x 75,000 hogs/wk =	30,750 kg/wk (804 mg/l)	20,500 kg/wk (804 mg/l)	1275 kg/wk (100 mg/l)	21,775 kg/wk (569 mg/l)	37,440 kg/wk	13,568 kg/wk
Daily Maximum =	0.4 kg/hog x 15,050 hogs/day =	6,020 kg/day (784 mg/l)	4,013 kg/day (784 mg/l)	512 kg/day (200 mg/l)	4,525 kg/day (590 mg/l)	9,676 kg/day	6,867 kg/day
TKN							
Weekly Average =	0.135 kg/hog x 75,000 hogs/wk =	10,125 kg/wk (265 mg/l)	6,750 kg/wk (265 mg/l)	1339 kg/wk (105 mg/l)	8,089 kg/wk (211 mg/l)	6,145 kg/wk	4,796 kg/wk
Daily Maximum =	0.14 kg/hog x 15,050 hogs/day =	2,107 kg/day (275 mg/l)	1,405 kg/day (275 mg/l)	281 kg/day (110 mg/l)	1,686 kg/day (220 mg/l)	1,659 kg/day	2,042 kg/day
Oil & Grease							
Weekly Average =	0.26 kg/hog x 75,000 hogs/wk =	19,500 kg/wk (510 mg/l)	13,000 kg/wk (510 mg/l)	383 kg/wk (30 mg/l)	13,383 kg/wk (350 mg/l)	5,865 kg/wk	5,765* kg/wk
Daily Maximum =	0.19 kg/hog x 15,050 hogs/day =	2,860 kg/day (373 mg/l)	1,906 kg/day (373 mg/l)	256 kg/day (100 mg/l)	2,162 kg/day (282 mg/l)	1,995 kg/day	3,524* kg/day
Total Phosphorus							
Weekly Average =	0.017 kg/hog x 75,000 hogs/wk =	1,275 kg/wk (33.3 mg/l)	850 kg/wk (33.3 mg/l)	170 kg/wk (13.3 mg/l)	1,020 kg/wk (26.7 mg/l)	N/A	579 kg/wk
Daily Maximum =	0.016 kg/hog x 15,050 hogs/day =	241 kg/day (31.4 mg/l)	161 kg/day (31.4 mg/l)	32 kg/day (12.5 mg/l)	193 kg/day (25 mg/l)	N/A	330 kg/day

* Oil & Grease values omit one "flyer".



For the past year, Maple Leaf has conducted considerable research regarding variations in oil and grease (O&G) test results depending on which specific testing methodology is used by the outside analytical laboratory. In Standard Methods for the Examination of Water and Wastewater, test method 5520 for oil and grease includes several methods for testing this parameter, including gravimetric and infrared measurement methods. From this research, it appears the infrared method includes other organic material besides fat, oil and grease. Consequently the results of O&G analyses using the infrared method are higher than those obtained from using the gravimetric method. The O&G projections in Table I are based on results from testing using the infrared method. The City of Brandon's outside laboratory used the gravimetric procedure for several years. However, when the analytical laboratory was changed, the oil and grease methodology changed to infrared. It is the City's intention to return to the gravimetric method. If the gravimetric method is used in the future, O&G values will be lower than the values cited in Table I.

Table I is for process wastewater alone and does not include sanitary wastes from toilets, urinals, lavatories, drinking fountains, the laundry, and the cafeteria. At the increased production of 75,000 hogs/wk, sanitary wastes are projected to be approximately as shown in Table II.

TABLE II – SANITARY WASTE LOADS

FLOW:	
Non-Kill Days	25 m ³ /day
Kill-Day Average	207 m ³ /day
Peak Hourly	1.1 m ³ /minute
Instantaneous Peak	1.65 m ³ /minute
CONSTITUENTS:	
CBOD ₅	480 mg/l
	100 kg/day
TSS	480 mg/l
	100 kg/day
TKN	32 mg/l
	6.6 kg/day
Total P	12 mg/l
	2.5 kg/day

Both the chemically-pretreated process wastewater and the screened sanitary wastes will continue to be discharged into the covered anaerobic lagoon at the COB IWWTF.