

AUG 26 2013

Box 48, RR 1  
Landmark, MB  
R0A 0X0

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June 12, 2013

**Attention:** RM of Tache / Technical Review Committee

**RE: Application for Expansion of Bronson Dairy Inc.**

Bronson Dairy current operates a 950 (lactating and dry cow) dairy in the RM of Tache. It currently uses 3 yard sites for this production. All milking cows are at the main yard site with associated livestock placed throughout the 3 sites.

	Current Au	Proposed AU
1. NE9-8-5e (main yard site: milking parlor)	1650au	2000au
2. NE13-8-4e	80au	0au
3. NW7-8-5e (this site is permitted for 399au)	170au	160au

(for purposes of the determining landbase requirements animal units from all three sites were used)

Bronson Dairy would like to expand the home yard site to potentially house 1080 (lactating and dry cows) and most of the associated livestock on the main yard site for ease of management. (with the exception of NW7-8-5e which will maintain some animals) The existing EMS and 2 under barn storages can accommodate this expansion. Currently about 25-30% of the total manure production is solid manure. In the expansion this will be reduced to about 10% of the total manure production which will reduce field storage of the solids and reduce trucking of straw and solid manure.

Bronson Dairy is also looking to install a Bedding Recovery Unit (BRU) to recycle bedding material on the yard. One of the main advantages is the significant reduction in straw required by the farm. (which also reduces nitrogen and phosphorus brought onto the farm and later applied as manure) I've enclosed brochures on the unit to better explain the advantages of this treatment system.

Russ Braun

(Owner)

If you have any questions please don't hesitate to contact me.

[rsbraun@nhs.ca](mailto:rsbraun@nhs.ca)

Phone: 355-4133

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## SITE ASSESSMENT

### For Large Livestock Operation Proposals (300 Animal Units or more)

#### Purpose

The set up, or expansion, of a livestock operation that has 300 Animal Units or more is subject to [Part 7 of The Planning Act](#). This includes consideration as a conditional use by the municipal council or planning district board. It also includes a review by the Technical Review Committee (TRC) appointed by the Minister of Local Government. The [Technical Review Committee Regulation](#) requires a site assessment to help the committee do its review and allow people who will be affected by the livestock operation to comment on the proposal.

#### Description of Operation

Operation name: Bronson Dairy Inc.

Operation location (project site): 1

Rural Municipality (RM) of Teche

Legal description: section, township, range or river lot(s)

NE 9-8-5e

Municipal tax roll number(s) 0023000.000

Show the location of the operation (project site) on a location map. (See [Location Map](#) for example).

For help with mapping, contact your [Community and Regional Planning Regional Office](#).

Location Map attached

For links to resources, click on the **highlighted underlined items**.

For definitions, click on the [Glossary of Terms](#).

For additional help, contact the [Technical Review Coordination Unit](#).

**Nature of Project** New operation Expansion of existing operation

State if any existing buildings will be replaced or demolished. If existing buildings will be reused, state how they will be reused.

Additional infrastructure to be added to increase farm's capacity.  
 - one barn on site maybe converted to shop  
 - Pole barn will be used for bedding storage

**Proposed Type and Size of Operation**

State the proposed type and size of the operation. (See [Animal Units Calculation Table](#).)

Type of operation (Column B from Animal Unit Calculation Table)	Existing number of animals (Column C from Animal Unit Calculation Table)	Total Animal Units (Column F from Animal Unit Calculation Table)
Dairy	950 dry + lactating amongst 3 sites (including associated livestock	1080 Dry + lactating including associated livestock = 2160 animal units although in expansion 160 av will remain at other site so only 2000 av will be kept at main site

 Animal Units Calculation Table attached**Animal Confinement Facilities**

To ensure a confined livestock area can be built in a way that ensures the environment is protected, a permit is required for operations with 300 Animal Units or more. Permits are required by the [Livestock Manure and Mortalities Management Regulation](#), under *The Environment Act* (MR 42/98).

Type of housing:  barn    outdoor seasonal feeding area    feedlot

- one small area where cows have outdoor access will be removed in expansion  
 Show all existing and proposed buildings on the project site plan. See [Project Site Plan example](#) and the Project [Site Plan Guide](#) for help creating your site plan.

 Project Site Plan attached

### Environmental Farm Planning

Environmental farm planning is a voluntary, confidential self-assessment process designed to help farm managers identify the environmental strengths and weaknesses of their operations.

Do you have an Environmental Farm Plan  yes  no - completed on EFP in 2007, now needs to recertify as 5 years has passed - see attached certificate

### Water

#### Project Sites Unsuitable for Development

To protect water quality, the Nutrient Management Regulation (MR 62/2008), under *The Water Protection Act*, prohibits the set up or expansion of nutrient generating facilities in Nutrient Management Zone 4 (Agriculture Capability Class 6, 7 and unimproved organic soils) and Nutrient Buffer Zones. This includes barns, confined livestock areas and manure storage facilities

The Nutrient Buffer Zone is an area of land along water bodies (ex: rivers, lakes, streams, drains) that varies, depending on the waterway.

The proposed barn and/or manure storage facility:

is   
is not

located within Nutrient Management Zone 4 (Class 6, 7 and unimproved organic soils) or any Nutrient Buffer Zone.

Determine the agriculture capability class (es) of the project site, and its limitations. (See Agri-Maps.) - Site has an ag. capability of 3W - see map

#### Water Source

To be sustainable, a livestock operation must have access to a sufficient quantity and quality of water for livestock.

Water source for operation:

- pipeline (public)       river  
 lake  
 dugout (dimensions : \_\_\_\_\_ x \_\_\_\_\_ x \_\_\_\_\_)  
 proposed well       existing well

If using an existing well, provide a copy of the water well log and logs for other wells on the property. Logs can be obtained from Manitoba Water Stewardship by calling 204-945-7418 in Winnipeg; 1-800-214-6497 toll free.

- attach well logs for barn + license

### Source Water Analysis Reports

[Annual, livestock, source water monitoring analysis reports](#) must be submitted to Manitoba Conservation, for existing operations with operations of 300 Animal Units or more.

Have you submitted an annual, source water monitoring report for the current calendar year?  yes  no *-attached 2012 submitted report*

Will livestock have direct access to surface water?  yes  no

If yes, identify:

Name of the water body \_\_\_\_\_

Steps that will be taken to prevent direct access of livestock to the water body.

\_\_\_\_\_  
 \_\_\_\_\_

### Water Requirements

To protect the sustainability of water sources, all operations using more than 25,000 litres (5,499 imperial gallons) per day must have the Water Rights Licence required by the Water Rights Regulation (MR 126/87) under *The Water Rights Act*.

For more information, contact the Water Use Licensing Section at 204-945-3983 in Winnipeg; 1-800-214-6497 toll free.

### Water Use

To calculate the total water use, go to the [Water Requirement Calculation Table](#).

Maximum daily use: *38 346.3*  imperial gallons or  litres

Maximum annual use: *13 996 399*  acre-feet or  cubic decameters

*Imp gallons*

Water Requirement Calculation Table attached

### Ground Water (Contamination Risk Protection)

Improper storage and handling of manure or mortalities increases the risk of contaminating groundwater. Beneficial management practices (BMP), mitigation measures and requirements for the permit process reduce this risk. Soil testing, manure management planning and proper engineering, along with construction and management of manure storage structures reduce the risk of contaminating groundwater.

Check the mitigation measures used for the existing components of the operation that may pose a risk of contamination. Also check any measures that may be used with the proposed components for this expansion, if applicable:

	Exist	Proposed
Manure is stored in a storage facility built by permit or registered by Manitoba Conservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Storage includes leachate collection.	<input type="checkbox"/>	<input type="checkbox"/>
Earthen storage has between 400 and 500 days' storage.	<input type="checkbox"/>	<input checked="" type="checkbox"/> - wonder barn storage as high as 430 days
Steel/concrete tank has between 250 and 500 days' storage.	<input type="checkbox"/>	<input type="checkbox"/>
Manure storage facility meets required setbacks.	<input checked="" type="checkbox"/>	<input type="checkbox"/> - EMS yes under barn storage no
Field storage (solid manure) locations are changed annually.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Field storage meets required setbacks.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
All application fields are soil tested annually for nitrate-N and Olsen phosphorus.	<input checked="" type="checkbox"/>	<input type="checkbox"/> every field to receive manure is tested in application year (not in non application year)
All manure is applied according to a manure management plan.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Licensed commercial manure applicator is used to apply manure.	<input type="checkbox"/>	<input type="checkbox"/> owner applies manure
Abandoned wells have been properly sealed.	<input type="checkbox"/>	<input type="checkbox"/>

Other:

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### Flooding

The Livestock Manure and Mortalities Management Regulation prohibits an operator from putting a manure storage facility within the boundaries of the 100-year flood plain elevation. Manure storage facilities that have protection for a flood-water level at least 0.6 meters higher than the 100-year flood water level are exempt.

The Designated Flood Area Regulation under *The Water Resources Administration Act* requires a Designated Flood Area Permit before a proposed structure (such as a barn) can be built within a Designated Flood Area.

The flood protection level for structures located within a Designated Flood Area is the 100-year flood elevation or an elevation set by Manitoba Water Stewardship. Contact the Forecasting and Flood Co-ordination Branch at 204-945-2121 in Winnipeg; 1-800-214-6497 toll free.

The proposed site:  
is  is not

located in a Designated Flood Area: Red River Valley Designated Flood Area or Lower Red River Designated Flood Area

**Note:** At the time a permit is issued, verification is needed to ensure any proposed barns are located within the 100-year flood plain elevation; or an elevation set by Manitoba Water Stewardship.

### Watershed Management Planning

Integrated watershed management planning is a co-operative effort by local residents, stakeholders and governments to create a long term plan to manage water and land-based activities for watersheds.

What are the names of the watershed and sub-watershed where the livestock operation and the fields identified for manure application are located.

Name of watershed(s): Seine River

Name of sub-watershed(s): \_\_\_\_\_

Name of Integrated Watershed Management Plan for the proposed project site, if applicable: Seine River Integrated Watershed Management Plan

For more on Integrated Watershed Management Planning, call Watershed Planning and Programs at 204-945-7408 in Winnipeg; 1-800-214-6497 toll free.

### Manure Related

The Livestock Manure and Mortalities Management Regulation sets requirements for the use, management and storage of livestock manure in agricultural operations, to ensure it is handled in an environmentally sound manner. For more on this, call Manitoba Conservation at 204-945-5168 in Winnipeg.

Improper storage, handling and/or land application of manure can contaminate water and/or cause unacceptable odours for neighbours. The following is used to assess the manure management system.

#### Manure Type

The type of manure generated and used by the operation influences storage, handling and land application options available.

What type(s) of manure will be generated?

solid  
*existing*

semi-solid

liquid  
*all of expansion will be liquid*

#### Manure Volume or Weight

The quantity of manure will determine the capacity requirements for the manure storage facility or field storage area.

What is the total volume or weight of manure generated annually by the livestock operation? (See Manure Storage Calculation Table.)

liquid volume: 8.928 million Imp gal solid weight: 114 245 cu ft / yr

*- held in barn then piled outside barn hauled to field*

Manure Storage Calculation Table attached

*also attached calculation using Gary Plohman's numbers*

**Manure Storage Type and Capacity**

The type of storage system used will affect the capacity requirements for the manure storage facility or field storage area.

What type of manure storage system will be used by the operation?

- under-barn concrete     earthen     concrete/steel tanks
- field storage     confined livestock area

*↳ only small area outside which will be removed in expansion*

Provide the dimensions of the existing and/or proposed manure storage facilities, if applicable. (See [Existing and Proposed Manure Storage Facility Dimensions Table](#).)

Existing and Proposed Manure Storage Facility Dimension Table attached

**Odour Control Measures (project site)**

Barns and manure storage facilities can be significant sources of livestock odours. The use of manure storage covers and shelterbelts can reduce this, particularly for the neighbourhoods close to the operation.

What odour control measures you are planning to use?

Manure storage cover:             yes     no  
Type of cover: \_\_\_\_\_

Shelterbelt planting:  yes     no     existing shelterbelt

Other measures (specify): \_\_\_\_\_

**Manure Treatment**

The [Livestock Manure and Mortalities Management Regulation](#) states that nobody can expand a confined livestock area or a manure storage facility for pigs, unless it includes anaerobic digestion or other environmentally sound manure treatment that is the same or better than anaerobic digestion. The alternative treatment must be approved by the Manitoba government.

Does your proposal include anaerobic digestion or another environmentally sound treatment for manure?  yes     no     not applicable

*?? will be adding a Bedding Recovery Unit. BRU.*

**Manure Application Method**

The [Livestock Manure and Mortalities Management Regulation](#) requires the registration of annual manure management plans for new or expanding operations with 300 Animal Units or more.



Does the operation currently file an annual manure management plan with Manitoba Conservation? (For operations with 300 Animal Units or more, only)

yes  no

Manure application methods and the season they're applied in affect odour, nutrient availability, crop response, land base requirements and the risk of water contamination.

Application method:  broadcast  broadcast and incorporation within 48 hours  
 injection

*-solids are spread + worked in w/in a week  
 -aerway troller for liquid manure followed by a disc or cultivator (annual land)*

The **Livestock Manure and Mortalities Management Regulation** prohibits new operations and existing livestock operations 300 Animal Units or more from application of manure, from November 10 of one year to April 10 of the following year (winter application).

Time of year for application:  spring  summer  fall

The **Livestock Manure and Mortalities Management Regulation** puts restrictions on fall application of manure in the Red River Valley Special Management Area.

The proposed spread fields:

are   
 are not

in the **Red River Valley Special Management Area**.

#### Land Available for Manure Application

The land available for manure application includes all suitable land (owned, leased or under agreement) that is available to the operation for manure application. Manure from any other livestock operation is not permitted to be used on this land.

Under the **Livestock Manure and Mortalities Management Regulation** and the **Nutrient Management Regulation**, application of nutrients is not permitted on **Agriculture Capability Class 6, 7 and unimproved organic soils (Nutrient Management Zone 4) and within Nutrient Buffer Zones**. The Nutrient Buffer Zone is an area of land along water bodies (ex: rivers, lakes, streams, drains) that varies depending on the waterway.

Areas of a field that are Class 6, 7, unimproved organic soils (Nutrient Management Zone 4) or are within the nutrient buffer zones are considered unsuitable for manure application. In addition, fields with 60 parts per million Olsen phosphorus (P) in the top six inches (15 centimetres) of soil will not be included in the land base calculation.

Use the [Manure Application Field Characteristics Table](#) to determine the following:

**Total suitable area available for manure application**

2020

Manure Application Field Characteristics Table attached

Copies of **soil test reports** that are no more than 12 months old must also be included with this submission.

Soil test reports for the required area for manure application attached.

### **Land Required for Manure Application**

Long term, land base requirements for manure application are calculated based on estimates of the quantity of nutrients (nitrogen and phosphorus) excreted by livestock and the removal of nutrients by the proposed crops.

### **Phosphorus**

The quantity of phosphorus excreted by the livestock depends on the type, number and age of livestock (see [Animal Units Calculation Table](#)), the quantity and availability of phosphorus fed to the livestock and the amount retained by the livestock.

The removal of phosphorus by crops depends on the crops grown and the historical crop yield averages. (See [Manure Application Field Characteristics Table](#).)

The [Livestock Manure and Mortalities Management Regulation](#) requires that the proposal must satisfy Manitoba Conservation that “sufficient land is available to the operator to implement an appropriate manure management plan” for a manure storage facility, before Manitoba Conservation issues a permit.

In areas of high livestock intensity (ex: RMs of Hanover and La Broquerie), it is Manitoba Conservation policy to approve a manure storage facility permit if the operation shows it has access to sufficient suitable land to apply manure at a rate equivalent to one times the crop removal rate of phosphorus.

Are any of the lands for manure application in the RMs of Hanover or La Broquerie?  yes  no

In areas with lower livestock intensity, Manitoba Conservation may issue a manure storage facility permit, if:

- the operation shows it has access to sufficient suitable land to apply manure at a rate equivalent to two times the crop removal rate of phosphorus (and)
- if long-term phosphorus inputs from manure application will be balanced with one times the crop removal rate of phosphorus to prevent build up in soils

Use the [Land Base Calculator](#) to calculate the minimum area required for manure application.

<b>Total minimum area required for manure application at two times crop removal, for operations outside of Hanover and La Broquerie</b>	<p style="text-align: center;">2018</p>
<b>Total minimum area required for manure application at one times crop removal, for operations within Hanover and La Broquerie AND For the long-term sustainability of operations outside of Hanover and La Broquerie</b>	<p style="text-align: center;">4035</p>

For more, call Manitoba Agriculture, Food and Rural Initiatives (MAFRI) at 204-945-3869 in Winnipeg or contact your local [MAFRI GO Office](#).

Land Base Calculator attached

#### Land Base Requirement Summary

By comparing the land available for manure application with the land required for manure application, state whether sufficient suitable land for manure application:

- has not been identified
- has been identified for two times the crop removal rate of phosphorus (for operations outside of the RMs of Hanover or La Broquerie)
- has been identified for one times the crop removal rate of phosphorus (for operations within the RMs of Hanover and La Broquerie)

I acknowledge that over the long term, up to 4035 acres/hectares (which is one times crop removal from table above) may be required for the long term environmental sustainability of the operation.

## Mortalities (Dead Animal) Disposal

The [Livestock Manure and Mortalities Management Regulation](#) sets requirements for the use, management and storage of livestock mortalities in agricultural operations. It ensures livestock mortalities are handled in an environmentally sound manner. Permanent composting facilities require a permit from Manitoba Conservation. Winter application of composted mortalities is prohibited.

Type of disposal:  rendering  
 composting - on concrete pads  
 incineration (in approved incinerator only)

## Mass Mortalities

The [Livestock Manure and Mortalities Management Regulation](#) sets requirements for mass mortalities.

A plan for mass mortalities (endorsed by Manitoba Conservation) is in place.

What steps will be taken in the case of mass mortalities?

- Bredy landfill or burial at farm

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## Project Site Description: land use planning considerations

For assistance contact your [Community and Regional Planning Regional Office](#).

## Development Plan and Zoning Bylaw

The Development Plan and Zoning Bylaw adopted under [The Planning Act](#), set policy and regulations for the use and development of land. A proposed livestock operation must comply with the requirements of this bylaw. In the absence of a bylaw, the [Provincial Planning Regulation](#) under [The Planning Act](#) applies.

### Development Plan

Every development plan must contain a livestock operation policy (LOP) that identifies areas where new or expanded livestock operations may be allowed. It must also set general standards for the location and setback of livestock operations. Identifying the plan's land use designation and policies (for the planning district or municipality that affect the site and proposed spread fields) will help confirm the project's compliance.

Name of development plan	RM of Tache Dev. Plan
By-law number	17-2009
Land use designation of project site	General Ag. Area
Livestock operation policies – quote supportive policy numbers	
Other development plan policies – quote supportive policy numbers	
Non-supportive development plan policies	

The development plan livestock operation policies support the size and location of the proposed operation.

### Zoning Bylaw

Identifying the zoning for the project site, the proposed spread fields and the related zoning provisions, helps determine the project's compliance and the minimum separation distances needed between the operation and property boundaries and other natural features and land uses. The zoning bylaw contains specific regulations that govern location and setback of livestock operations.

What are the minimum project site requirements stated in the zoning bylaw?

	Project site dimensions	Minimum zoning bylaw site requirements
Minimum site area	160 acres	80a
Minimum site width	1176'	600'
Minimum front yard	1650'	200'
Minimum side and rear yard	1176' side ?	75' ?

**Separation Distances**

Using the proposed size of the operation (see [Animal Units Calculation Table](#)) and the type of animal housing and manure storage facility, complete the following table.

Indicate the distance from:

- earthen manure storage facility or feedlot **OR** *- used CMS as this is what the expansion is related to even though there is solid manure generated on existing operation*
- animal confinement facility or non-earthen manure storage facility *on existing operation*

To	Minimum separation distance required (by the zoning bylaw)	If land use feature is within the minimum distance	
		Provide actual distance	Provide location or name of feature (ex: Red River)
Residence/dwelling	2297'	2330'	on SE 9-8-50
Designated area (non-agricultural)	9186'	3378'	residential area on SE 9-8-50
Surface water			
Surface watercourse			
Crown land			
Wildlife Management Area			
Livestock operation			
Other significant features/land uses			

*note there is a closer house but it is owned by Bronson Dairy owners.*

In cases where minimum separation distances are not stated in the zoning bylaw or development plan, the minimum separation distances in the [Provincial Planning Regulation](#) apply.

Show: a) location of the project site, location and ownership of spread fields and c) land uses and significant features (i) within a 3 kilometre radius of the project site and (ii) within and adjacent to each spread field on a Land Use & Spread Field Map. (See [Land Use & Spread Field Map Example](#)).

Land Use & Spread Field Map attached

### **Truck Haul Routes and Access Points**

One consideration with new or expanding livestock operations is the potential impact on existing public roads (municipal and provincial), access and the need for improvements or mitigation.

What roads and access points will be used for the proposed operation? (See [Truck Haul Routes and Access Points Map](#) for an example).

For help with mapping, contact your [Community and Regional Planning Regional Office](#).

Truck Haul Routes and Access Points Map attached

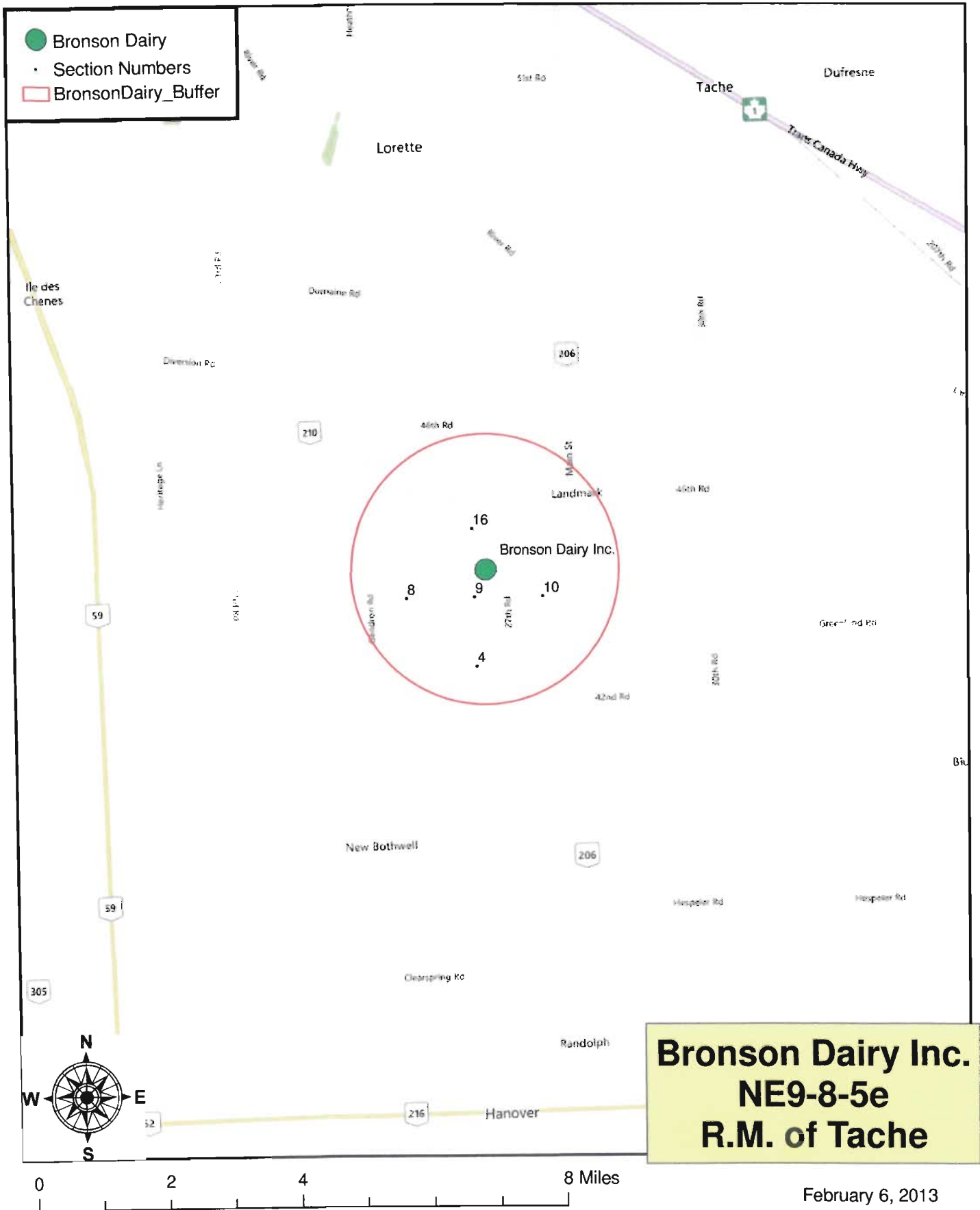
### **Supporting Documents**

Check off the supporting documents included in this submission:

- Contact Information and Privacy and Publication Notice**
- Location Map** (shows proposed project within rural municipality)
- Animal Unit Calculation Table**
- Water Requirement Calculation Table**
- Manure Storage Calculation Table**
- Existing and Proposed Manure Storage Facility Dimension Tables**  
(if applicable)
- Manure Application Field Characteristics Table**
- Recent manure **application field soil sample results** (Nitrate- N lb/ac at 0-6 and 6-24 inch depths, Phosphorus – ppm at 0-6 inch depth)
- Land Base Calculator**
- Project Site Plan** (proposed operation showing current and proposed structures)
- Land Use and Spread Field Map** (location and ownership of operation, spread fields, location and distance to non-agricultural uses, development plan designation, zoning for project site and spread fields)
- Truck Haul Routes and Access Points Map** (with routes and access points on municipal/provincial roads and/or provincial trunk highways)



# R.M of Tache



# Animal Units Calculation Table

*includes dry cows*  
*at all 3 sites*

Animal Type	Type of Operation	Existing Number	Proposed Additional Number	Animal Units per Head	Total Animal Units	Annual Confinement Period (Days)
Dairy	Cows - milking cows	950	130	2	2160	365
Beef	Beef cows including associated livestock			1.25	-	
	Backgrounder			0.5	-	
	Summer pasture / replacement heifers			0.625	-	
	Feeder cattle			0.769	-	
Pigs	Sows - farrow to finish (234-254 lbs)			1.25	-	
	Sows - farrow to weaning (up to 11 lbs)			0.25	-	
	Sows - farrow to nursery (51 lbs)			0.313	-	
	Boars (artificial insemination units)			0.2	-	
	Weanlings, Nursery (11-51 lbs)			0.033	-	
	Growers / Finishers (51-249 lbs)			0.143	-	
Chickens	Broilers			0.005	-	
	Roasters			0.01	-	
	Layers			0.0083	-	
	Pullets			0.0033	-	
	Broiler breeder pullets			0.0033	-	
	Broiler breeder hens			0.01	-	
Turkeys	Broilers			0.01	-	
	Heavy Toms			0.02	-	
	Heavy Hens			0.01	-	
Horses	Mares			1.333	-	
Sheep	Ewes			0.2	-	
	Feeder lambs			0.063	-	
Other Livestock	Type:					
	Type:					
				<b>Total AUs</b>	<b>2160</b>	<b>365.00</b>

For all other livestock or operation types please inquire with your Manitoba Agriculture, Food and Rural Initiatives GO office to determine the animal units per head [www.gov.mb.ca/agriculture/contact/agoffices.html](http://www.gov.mb.ca/agriculture/contact/agoffices.html)

*1650 av on main site currently going to 2000 av in expansion*

# Animal Units Calculation Table

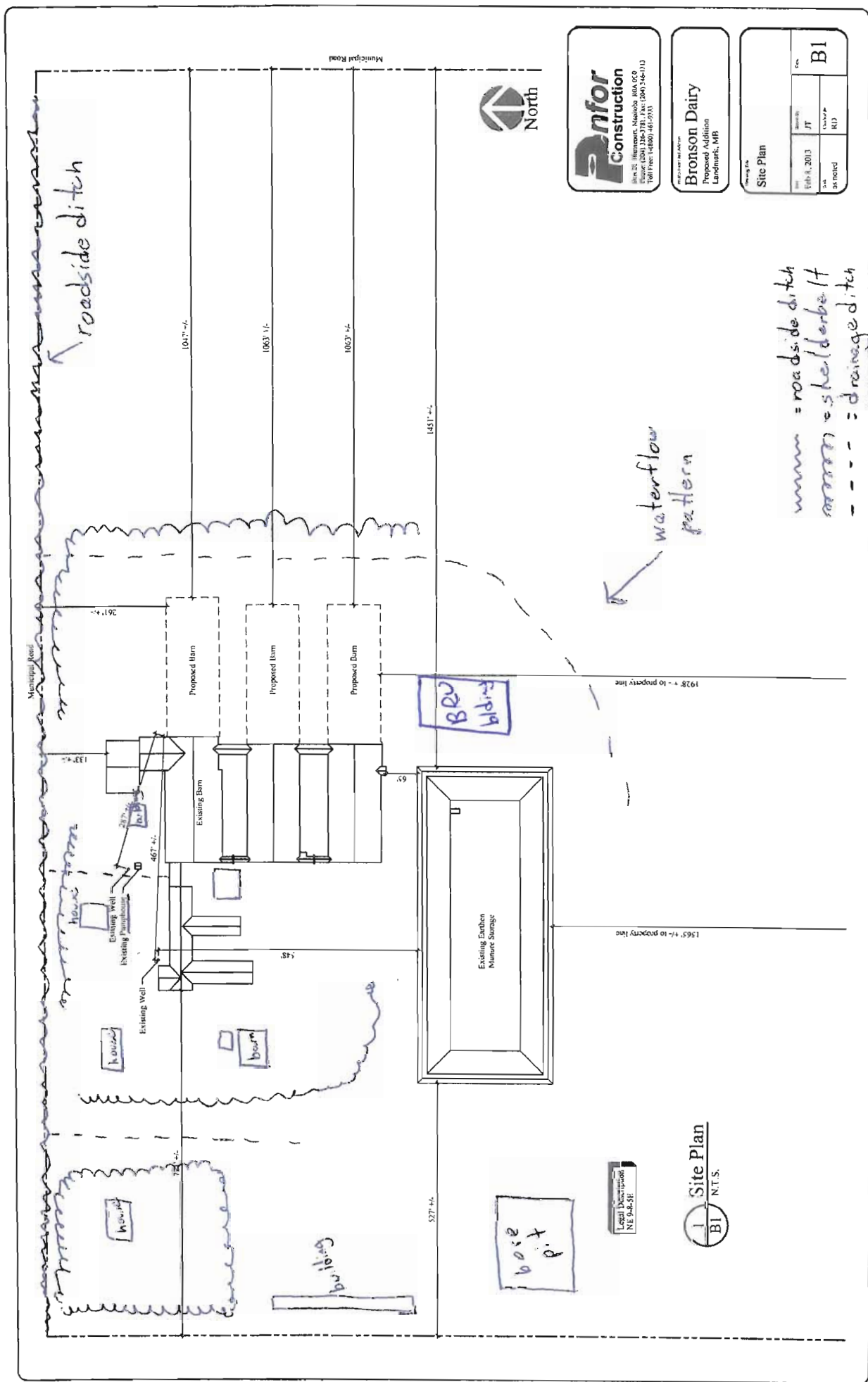
A	B	C	D	E	F	G
Animal Type	Type of Operation	Existing Number of Animals	Proposed Additional Number of Animals	Animal Units per Head	Total Animal Units	Annual Confinement Period (Days)
Dairy <sup>1</sup>	Mature cows (lactating and dry) including associated livestock			2	-	
	Mature cows (lactating and dry)	950	130	1.35	1,458.00	
	Heifers (0 to 3 months)	160	22	0.16	29.12	
	Heifers (4 to 13 months)	362	50	0.41	168.92	
	Heifers (> 13 months)	334	46	0.87	330.60	
	Bulls			1.35	-	
	Veal calves			0.13	-	
Beef	Beef cows including associated livestock			1.25	-	
	Backgrounder			0.5	-	
	Summer pasture / replacement heifers			0.625	-	
	Feeder cattle			0.769	-	
Pigs	Sows - farrow to finish (234-254 lbs)			1.25	-	
	Sows - farrow to weanling (up to 11 lbs)			0.25	-	
	Sows - farrow to nursery (51 lbs)			0.313	-	
	Boars (artificial insemination units)			0.2	-	
	Weanlings, Nursery (11-51 lbs)			0.033	-	
	Growers / Finishers (51-249 lbs)			0.143	-	
Chickens	Broilers			0.005	-	
	Roasters			0.01	-	
	Layers			0.0083	-	
	Pullets			0.0033	-	
	Broiler breeder pullets			0.0033	-	
	Broiler breeder hens			0.01	-	
Turkeys	Broilers			0.01	-	
	Heavy Toms			0.02	-	
	Heavy Hens			0.01	-	
Horses	Mares			1.333	-	
Sheep	Ewes			0.2	-	
	Feeder lambs			0.063	-	
Other Livestock	Type:				-	
	Type:				-	
				<b>Total AUs</b>	<b>1,986.64</b>	-

**Footnotes:**

<sup>1</sup> There are 2 methods for calculating animal units for dairy (Farm Practices Guidelines for Dairy Producers in Manitoba, 1995). You can enter the total number of mature cows in the milking herd under the "Mature cows (lactating and dry) including associated livestock" category and the animal units will be calculated by multiplying this number by 2. This calculation assumes 85 lactating, 15 dry, 12 heifers (0 to 3 months), 36 heifers (4 to 13 months) and 50 heifers (> 13 months) for an operation with 100 mature cows. "Associated livestock" includes all of the heifer calves and replacement heifers. Alternatively, you can enter animal numbers in the individual categories (mature cows, heifers (0 to 3 months), heifers (4 to 13 months) and heifers (> 13 months)) and they will be summed at the bottom of the table. Bulls and veal calves are always calculated separately.

For all other livestock or operation types please inquire with your Manitoba Agriculture, Food and Rural Initiatives GO office to determine the animal units per head.  
[www.gov.mb.ca/agriculture/contact/agoffices.html](http://www.gov.mb.ca/agriculture/contact/agoffices.html)

# Site Plan



**Panfor Construction**  
 300 West Street, Suite 100  
 Portland, ME 04101  
 Phone: (207) 753-1111

**Bronson Dairy**  
 Proposed Addition  
 Landmark, ME

Site Plan

DATE	1/18/13	BY	JT
SCALE	AS SHOWN	PROJECT	RD
PROJECT NO.			BI

~~~~~ = roadside ditch  
 ~~~~~ = shelter belt  
 - - - - = drainage ditch

waterflow pattern

BEV bldg

Legal Description  
 NE 2nd-5th

Site Plan  
 BI N.T.S.



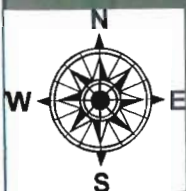
# Bronson Dairy



44th Rd

44th Rd

44th Rd



0 305 610 1,220 Feet

February 6, 2013

# Statement of Completion

Manitoba Environmental Farm Plan

This Is To Recognize That

## Bronson Dairy Inc.

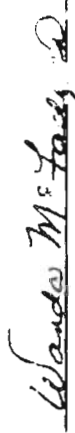
Has Successfully Completed The Environmental Farm Planning Process In The Province Of Manitoba  
As Per The Approved Methodology For Manitoba.

Farm Stewardship Association of Manitoba Inc.



J.S. U. H. Chair

Date of Issue: 6/29/2007



J.S. U. H. Executive Director

C.F.P. Number F3MB 2007/08-1554

# Agricultural Capability



0 1,050 2,100 4,200 Feet

February 6, 2013

bronson dairy

LOCATION: 9-8-5E

well\_PID: 100870  
 Owner: BRONSON DAIRY INC  
 Driller: Echo Drilling Ltd.  
 well Name: WELL #2  
 well Use: PRODUCTION  
 Water Use: Livestock, GEOTHERMAL  
 UTMX: 655115  
 UTMZ: 5501825  
 Accuracy XY: 1 EXACT [<5M] [GPS]  
 UTMZ: 238  
 Accuracy Z: 4 FAIR [5-10M]  
 Date Completed: 1996 Jul 02

## WELL LOG

| From<br>(ft.) | To<br>(ft.) | Log             |
|---------------|-------------|-----------------|
| 0             | 60.0        | CLAY            |
| 60.0          | 74.0        | DARK BROWN TILL |
| 74.0          | 290.0       | LIMESTONE       |
| 290.0         | 293.0       | SHALE           |
| 293.0         | 318.0       | SANDSTONE       |

## WELL CONSTRUCTION

| From<br>(ft.) | To<br>(ft.) | Casing<br>Type | Inside<br>Dia.(in) | Outside<br>Dia.(in) | Slot<br>Size(in) | Type   | Material  |
|---------------|-------------|----------------|--------------------|---------------------|------------------|--------|-----------|
| 0             | 78.0        | CASING         | 5.00               |                     |                  | INSERT | PVC       |
| 78.0          | 318.0       | OPEN HOLE      | 4.00               |                     |                  |        |           |
| 0             | 78.0        | CASING GROUT   |                    |                     |                  |        | BENTONITE |

Top of casing: 2.0 ft. above ground

## PUMPING TEST

Date:  
 Pumping Rate: 50.0 Imp. gallons/minute  
 water level before pumping: 18.0 ft. below ground  
 Pumping level at end of test: 50.0 ft. below ground  
 Test duration: ??? hours, ?? minutes  
 water temperature: ?? degrees F

-----  
LOCATION: NE9-8-5E

well\_PID: 76289  
 Owner: BRONSON DAIRY  
 Driller: Echo Drilling Ltd.  
 well Name: WELL #1  
 well Use: PRODUCTION  
 Water Use: Domestic, Livestock, GEOTHERMAL  
 UTMX: 655063  
 UTMZ: 5501808  
 Accuracy XY: 1 EXACT [<5M] [GPS]  
 UTMZ: 239  
 Accuracy Z: 4 FAIR - Shuttle at Centroid  
 Date Completed: 1993 Apr 20

## WELL LOG

| From | To | Log |
|------|----|-----|
|------|----|-----|





bronson dairy

| (ft.) | (ft.) |  |
|-------|-------|--|
| 0     | 2.0   | TOPSOIL  |
| 2.0   | 60.0  | CLAY   |
| 60.0  | 65.0  | SAND   |
| 65.0  | 76.0  | TILL   |
| 76.0  | 299.8 | LIMESTONE, LARGE FRACTURES AT 150 AND 260 FEET |
| 299.8 | 316.8 | SANDSTONE                                      |

WELL CONSTRUCTION

| From (ft.) | To (ft.) | Casing Type | Inside Dia.(in) | Outside Dia.(in) | Slot Size(in) | Type   | Material |
|------------|----------|-------------|-----------------|------------------|---------------|--------|----------|
| 0          | 80.9     | casing      | 5.00            |                  |               | INSERT | PVC      |
| 80.9       | 159.9    | open hole   | 4.75            |                  |               |        |          |
| 159.9      | 316.8    | open hole   | 4.00            |                  |               |        |          |

Top of Casing: 2.0 ft. above ground

PUMPING TEST

Date: 1993 Apr 20  
 Pumping Rate: 100.0 Imp. gallons/minute  
 water level before pumping: 30.0 ft. below ground  
 Pumping level at end of test: 50.0 ft. below ground  
 Test duration: 1 hours, minutes  
 water temperature: ?? degrees F

Issued in accordance with the provisions of  
The Water Rights Act and regulations made thereunder.

Licence No.: 2008-063

U T M: Zone 14 655063 E  
5501808 N

Know all men by these presents that in consideration of and subject to the provisos, conditions and restrictions hereinafter contained the Minister of Water Stewardship for the Province of Manitoba does by these presents give full right and liberty, leave and licence to **Bisonex Dairy Inc.** of the **Rural Municipality of Tache** in the Province of Manitoba (hereinafter called "the LICENSEE") to divert water from two aquifers, a sandstone aquifer and a fractured-limestone aquifer by means of two water wells, pumps, pipelines) and other appurtenances (hereinafter called "the WORKS"), located on the following described lands:

the North East Quarter of Section 9, in Township 8 and Range 5, East of the Principal Meridian in Manitoba, more particularly described on Certificate of Title No. 1800882 WLTO.

and more particularly shown on a plan filed in the office of the Executive Director, Regulatory and Operational Services Division, a copy of which plan is hereto attached and marked Exhibit "A" for agricultural-livestock and air heating and cooling purposes on the following described lands:

the North East Quarter of Section 9, in Township 8 and Range 5, East of the Principal Meridian in Manitoba, more particularly described on Certificate of Title No. 1800882 WLTO.

This licence is issued upon the express condition that it shall be subject to the provisions of The Water Rights Act and Regulations and all amendments thereto and, without limiting the generality of the aforesaid, to the following terms and conditions, namely:

1. The water shall be used solely for **agricultural-livestock and air heating and cooling** purposes.
2. The WORKS shall be operated in accordance with the terms herein contained.
3. a) The maximum rate at which water may be diverted from Well No. 1 (1993 well) pursuant hereto shall not exceed 0.003 cubic metres per second (0.1 cubic feet per second).  
b) The maximum quantity of water to be diverted from Well No. 1 (1993 well) in any one year shall be 31.1 cubic decametres (24.4 acre feet).  
c) For the Water Use Licensing Section's allocation planning purposes, the amount of water allocated from the sandstone aquifer at Well No. 1 (1993 well) shall be 15.55 cubic decametres (12.2 acre feet) and the amount of water allocated from the limestone aquifer at Well No. 1 (1993 well) shall be 15.55 cubic decametres (12.2 acre feet).  
d) The maximum rate at which water may be diverted from Well No. 2 (1996 well) pursuant hereto shall not exceed 0.003 cubic metres per second (0.1 cubic feet per second).  
e) The maximum quantity of water to be diverted from Well No. 2 (1996 well) in any one year shall be 31.1 cubic decametres (24.4 acre feet).  
f) For the Water Use Licensing Section's allocation planning purposes, the amount of water allocated from the sandstone aquifer at Well No. 2 (1996 well) shall be 15.55 cubic decametres (12.2 acre feet) and the amount of water allocated from the limestone aquifer at Well No. 2 (1996 well) shall be 15.55 cubic decametres (12.2 acre feet).
4. Water shall not be diverted during any period when the water level in the aquifer is measured at:
  - a) Well No. 1 is more than 24.66 metres (80.9 feet) beneath the surface of the ground.
  - b) Well No. 2 is more than 23.77 metres (78.0 feet) beneath the surface of the ground.
5. The LICENSEE does hereby remise, release and forever discharge Her Majesty the Queen in Right of the Province of Manitoba, of and from all manner of action, causes of action, claims and demands whatsoever which against Her Majesty the LICENSEE ever had, now has or may hereafter have, resulting from the use of water for **agricultural-livestock and air heating and cooling** purposes.
6. In the event that the rights of others are infringed upon and/or damage to the property of others is sustained as a result of the operation or maintenance of the WORKS and the rights herein granted, the LICENSEE shall be solely responsible and shall save harmless and fully indemnify Her Majesty the Queen in Right of the Province of Manitoba, from and against any liability to which Her Majesty may become liable by virtue of the issue of this Licence and anything done pursuant hereto.
7. This Licence is not assignable or transferable by the LICENSEE and when no longer required by the LICENSEE this Licence shall be returned to the Executive Director, Regulatory and Operational Services Division, for cancellation on behalf of the Minister.
8. Upon the execution of this Licence the LICENSEE hereby grants the Minister or the Minister's agents the right of ingress and egress to and from the lands on which the WORKS are located for the purpose of inspection of the WORKS and the LICENSEE shall at all times comply with such directions and/or orders that may be given by the Minister or the Minister's agents in writing from time to time with regard to the operation and maintenance of the WORKS.

9. This Licence may be amended, suspended or cancelled by the Minister in accordance with The Water Rights Act by letter addressed to the LICENSEE at: **Box 48, Landmark, MB, R0A 0X0, Canada** and thereafter this Licence shall be deemed to be at an end.
10. Notwithstanding anything preceding in this Licence, the LICENSEE must have legal control, by ownership or by rental, lease, or other agreement, of the lands on which the WORKS shall be placed and the water shall be used.
11. The term of this Licence shall be **ten (10) years** and this Licence shall become effective only on the date of execution hereof by a person so authorized in the Department of Water Stewardship. The LICENSEE may apply for renewal of this Licence not more than 365 days and not less than 90 days prior to the expiry date.
12. This Licence expires automatically upon the loss of the legal control of any of the lands on which the WORKS are located or on which water is used, unless the Licence is transferred or amended by the Minister upon application for Licence transfer or amendment.
13. The LICENSEE shall keep records of weekly and annual water use and shall provide a copy of such records to the Executive Director, Regulatory and Operational Services Division, not later than February 1st of the following year.
14. Flow meters must be installed, positioned to accurately measure instantaneous pumping rate and accumulative withdrawals from the water source.
15. The LICENSEE does hereby agree to correct to the satisfaction of the Minister, any water supply problems to other currently existing or proposed outputs or other forms of supply, which are partly or wholly attributable, in the opinion of the Minister, to the operation of the works authorized by this Licence.
16. The LICENSEE shall obtain and maintain all other regulatory approvals that may be required and shall comply with all other regulatory requirements for the construction, operation or maintenance of the WORKS, or to divert or use water as provided by this Licence.

REPORTING FORM - SOURCE WATER SAMPLING

Name of Operation

BROWSON DAIRY Inc.

Mailing Address

Box 48 RRI LANDMARK

MB Postal Code R2A 0X0

Location of Operation

NE 9-8-SE

Qtr Sec Twp Rge E/WPM or River Lot/Parish

Rural Municipality TACHE

Name of Contact

RUSSELL BRAUN

Contact Numbers

355-4133 355-4570 371-7688 355-9210  
Business Residence Cellular Facsimile

Water Source:

Well

Well location (legal description) NE 9-8-SE

Surface water

Name of surface water

Sampling location (legal description)

Other source

Specify (e.g. name of water cooperative)

Where was the water sample collected? (e.g. outside hydrant, house outside tap, kitchen tap)

WELL #1 INSIDE OLD MILK HOUSE WELL #2 OLD SIDE ELECTRICAL BUILDING

Date and time of sample collection

May 8 2012

Comments:

Remember to attach analytical results!

Proprietary (confidential) information will be protected in accordance with Manitoba law. Personal information is collected under the authority of The Environment Act, the Livestock Manure and Mortalities Management Regulation, and will be used for administration and enforcement purposes. Information collected is protected by the privacy provisions of The Freedom of Information and Protection of Privacy Act. If you have any questions, contact the Access & Privacy Coordinator, 1383 Whyte Avenue, Winnipeg MB R3E 1V7; 1-204-945-4176.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

| Sample Details/Parameters   | Result | Qualifier* | D.L.  | Units     | Extracted | Analyzed  | Batch    |
|---|--------|------------|-------|-----------|-----------|-----------|----------|
| <b>L1143970-1 BRONSON DAIRY - LANDMARK WELL #2</b><br>Sampled By: RUSS BRAUN on 08-MAY-12 @ 07:45<br>Matrix: UNTREATED WELL |        |            |       |           |           |           |          |
| <b>Livestock Source Monitoring</b>  |        |            |       |           |           |           |          |
| <b>Ammonia by colour</b>  |        |            |       |           |           |           |          |
| Ammonia, Total (as N)   | 0.449  |            | 0.010 | mg/L      |           | 11-MAY-12 | R2363677 |
| <b>Chloride by Ion Chromatography</b>   |        |            |       |           |           |           |          |
| Chloride  | 139    |            | 0.50  | mg/L      |           | 08-MAY-12 | R2362709 |
| <b>Conductivity</b>   |        |            |       |           |           |           |          |
| Conductivity  | 998    |            | 20    | umhos/cm  |           | 08-MAY-12 | R2362228 |
| <b>Fecal Coliform</b>   |        |            |       |           |           |           |          |
| Fecal Coliforms   | <1     |            | 1     | CFU/100mL | 08-MAY-12 | 09-MAY-12 | R2362952 |
| <b>Nitrate as N by Ion Chromatography</b>   |        |            |       |           |           |           |          |
| Nitrate-N   | <0.050 |            | 0.050 | mg/L      |           | 08-MAY-12 | R2362709 |
| <b>Nitrate+Nitrite</b>  |        |            |       |           |           |           |          |
| Nitrate and Nitrite as N  | <0.071 |            | 0.071 | mg/L      |           | 08-MAY-12 |          |
| <b>Nitrite as N by Ion Chromatography</b>   |        |            |       |           |           |           |          |
| Nitrite-N   | <0.050 |            | 0.050 | mg/L      |           | 08-MAY-12 | R2362709 |
| <b>Total Coliform Membrane Filtration</b>   |        |            |       |           |           |           |          |
| Total Coliforms   | <1     |            | 1     | CFU/100mL | 08-MAY-12 | 09-MAY-12 | R2362744 |
| <b>Total Kjeldahl Nitrogen</b>  |        |            |       |           |           |           |          |
| Total Kjeldahl Nitrogen   | 0.94   |            | 0.20  | mg/L      | 09-MAY-12 | 10-MAY-12 | R2363101 |

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

| Sample Details/Parameters                          | Result | Qualifier* | D.L.  | Units     | Extracted | Analyzed  | Batch    |
|--|--------|------------|-------|-----------|-----------|-----------|----------|
| <b>L1143969-1 BRONSON DAIRY - WELL #1 LANDMARK</b> |        |            |       |           |           |           |          |
| Sampled By: RUSS BRAUN on 08-MAY-12 @ 07:45        |        |            |       |           |           |           |          |
| Matrix: UNTREATED WELL                             |        |            |       |           |           |           |          |
| <b>Livestock Source Monitoring</b>                 |        |            |       |           |           |           |          |
| <b>Ammonia by colour</b>                           |        |            |       |           |           |           |          |
| Ammonia, Total (as N)                              | 0.447  |            | 0.010 | mg/L      |           | 11-MAY-12 | R2363677 |
| <b>Chloride by Ion Chromatography</b>              |        |            |       |           |           |           |          |
| Chloride   | 134    |            | 0.50  | mg/L      |           | 08-MAY-12 | R2362709 |
| <b>Conductivity</b>                                |        |            |       |           |           |           |          |
| Conductivity                                       | 983    |            | 20    | umhos/cm  |           | 08-MAY-12 | R2362228 |
| <b>Fecal Coliform</b>                              |        |            |       |           |           |           |          |
| Fecal Coliforms                                    | <1     |            | 1     | CFU/100mL | 08-MAY-12 | 09-MAY-12 | R2362952 |
| <b>Nitrate as N by Ion Chromatography</b>          |        |            |       |           |           |           |          |
| Nitrate-N  | <0.050 |            | 0.050 | mg/L      |           | 08-MAY-12 | R2362709 |
| <b>Nitrate+Nitrite</b>                             |        |            |       |           |           |           |          |
| Nitrate and Nitrite as N                           | <0.071 |            | 0.071 | mg/L      |           | 08-MAY-12 |          |
| <b>Nitrite as N by Ion Chromatography</b>          |        |            |       |           |           |           |          |
| Nitrite-N  | <0.050 |            | 0.050 | mg/L      |           | 08-MAY-12 | R2362709 |
| <b>Total Coliform Membrane Filtration</b>          |        |            |       |           |           |           |          |
| Total Coliforms                                    | <1     |            | 1     | CFU/100mL | 08-MAY-12 | 09-MAY-12 | R2362744 |
| Note: Non coliform colonies present                |        |            |       |           |           |           |          |
| <b>Total Kjeldahl Nitrogen</b>                     |        |            |       |           |           |           |          |
| Total Kjeldahl Nitrogen                            | 0.54   |            | 0.20  | mg/L      | 09-MAY-12 | 10-MAY-12 | R2363101 |

\* Refer to Referenced Information for Qualifiers (if any) and Methodology

Scott Dick

Subject: FW: trc

From: Plohman, Gary (MAFRI) [mailto:Gary.Plohman@gov.mb.ca]  
Sent: Friday, February 08, 2013 11:42 AM  
To: Scott Dick  
Subject: RE: trc

Hi Scott

Don't know if you still need this but I will attempt to answer some of your questions.

In the past we have attempted to break down the herd into its various animal sizes and numbers in order to come up with water use. The following table was used for a 1000 cow dairy:

Based on a typical water usage rates of 30 Imperial gallons (135 litres) per day per cow and 15 Imperial gal (68 litres) per day per dry cow and heifer, the daily total water consumption for the 1000 cow dairy facility will be approximately 41,000 Imperial gallons (186,000 litres) per day. The applicant has indicated that his water source is from a well located on site.

TABLE 2: WATER CONSUMPTION FOR DAIRY CATTLE

|                    | Number of Livestock of Each Type | Water Consumption for Each Type | Water Consumption (Imp. gal/day) |
|--------------------|----------------------------------|---------------------------------|----------------------------------|
| Dairy Milking Cows | 1000                             | 30.0                            | 30,000                           |
| Dairy Dry Cows     | 250                              | 15.0                            | 3,750                            |
| Dairy Heifers      | 250                              | 15.0                            | 3,750                            |
| Dairy Calves       | 500                              | 5                               | 2,500                            |
| Wash Water         | -                                | -                               | 1,100                            |
| <b>Total</b>       |                                  |                                 | <b>41,100</b>                    |

I do not know why the TRC water usage table they use now only shows cows and dry cows. They appear to be using the rates for each in the calculations and not a combined number so I think you should enter both. A typical herd breakdown of animals is shown.

In my opinion you should use 3.5 - 4 cu ft/cow/day for manure production so that you don't end up with a storage that is too small. I have seen solid manure production numbers for heifers that are all over the map so I would recommend using around 2.0 cu ft/heifer/day for unbred heifers.

Hope this helps.

Gary

41100 Imp gal/day for 1000 milking cows

For a 933 cow dairy multiply by .933 = 38346.3 Imp gal/day water use

# Water Requirement Calculation Table

| Livestock                     | Number | IG/day per animal in summer | IG/day per animal in summer | IG/day                     |
|-------------------------------|--------|-----------------------------|-----------------------------|----------------------------|
| <b>Beef/Dairy/Bison</b>       |        |                             |                             |                            |
| Feeder/heifer/steer (600 lb.) |        | 5                           | 9                           | -                          |
| Feeder (900 lb.)              |        | 7                           | 12                          | -                          |
| Feeder (1250 lb.)             |        | 10                          | 15                          | -                          |
| Cow/calf pair                 |        | 12                          | 15                          | -                          |
| Dry cow                       | 147    | 10                          | 12                          | 1,764                      |
| Milking cow                   | 933    | 25                          | 30                          | 27,990                     |
| Bison                         |        | 8                           | 10                          | -                          |
| <b>Horses</b>                 |        |                             |                             |                            |
| Horses                        |        | 8                           | 11                          | -                          |
| <b>Hogs</b>                   |        |                             |                             |                            |
| Sow (Farrow/wean)             |        |                             | 6.5                         | -                          |
| Dry Sow/Boar                  |        |                             | 4                           | -                          |
| Feeder                        |        |                             | 3                           | -                          |
| Nursery (33 lb.)              |        |                             | 2                           | -                          |
| <b>Chickens</b>               |        |                             |                             |                            |
| Broilers                      |        |                             | 0.035                       | -                          |
| Roasters/Pullets              |        |                             | 0.04                        | -                          |
| Layers                        |        |                             | 0.055                       | -                          |
| Breeders                      |        |                             | 0.07                        | -                          |
| <b>Turkeys</b>                |        |                             |                             |                            |
| Turkey Growers                |        |                             | 0.13                        | -                          |
| Turkey Heavies                |        |                             | 0.16                        | -                          |
| <b>Sheep/Goats</b>            |        |                             |                             |                            |
| Sheep/Goats                   |        |                             | 2                           | -                          |
| Ewes/Does                     |        |                             | 3                           | -                          |
| Lambs/Kids (90 lb.)           |        |                             | 1.6                         | -                          |
|                               |        | <b>TOTAL</b>                |                             | <b>29,754</b> per day      |
|                               |        | <b>TOTAL</b>                |                             | <b>10,860,210</b> per year |

Enter this number on page 4 of the Site Assessment.

Enter this number on page 4 of the Site Assessment.

**Notes:**

(Imperial gallons per day – IG/day)

For beef, dairy, bison and horse enterprises:  
Use summer numbers if appropriate for the operation.  
Otherwise base projections on winter values. Always use the greater of the two values.

Water Rights Licences are issued to a specific legal land description. Obtaining a Water Rights License or information as to the licensing requirements can be obtained through Manitoba Water Stewardship at (204) 945-3983 or 1-800-282-8069 Ext 3983.

Other consumption values:  
Normal household consumption, 40-55 imperial Gallons per day per person  
(180-250 l/day/person)  
Hydrant flow, 10 imperial GPM (45 l/min)

Conversion Factor: 1271,470 Imperial Gallons = 1 acre-foot

See following email from Gary Plohman Mb Agriculture

$$38346.3 \text{ gal/day} \times 365 =$$

$$13,996,399 \text{ gal/yr}$$

- there is no breakout for heifer water use (maybe included in cow #'s?)



### Manure Storage Calculation Table

| Animal Type | Type of Operation   | Storage Volume (ft <sup>3</sup> /day/animal)      |       |        | Confinement Period (Days) | Number of Animals | Total Storage Volume (AxBxC) |
|-------------|---|---|-------|--------|---------------------------|-------------------|------------------------------|
|             |   | Semi-solid  | Solid | Liquid |                           |                   |                              |
| Dairy       | Milking cows, including helpers                                   |   |       |        |                           |                   | -                            |
|             | Free stall  | 3.43  | 2.47  | 1.06   | 365                       | 980               | 1228911                      |
|             | Tie stall   | 3.53  | 2.44  | 1.10   |                           |                   | -                            |
|             | Loose housing   |   | 2.85  | 0.42   | 365                       |                   | 0                            |
|             | Milk house wash water   |   |       | 0.60   | 365                       | 980               | 214620                       |
| Beef        | Beef cows including associated livestock                          |   | 1.20  |        |                           |                   | -                            |
|             | Backgrounder  |   | 0.73  |        |                           |                   | -                            |
|             | Summer pasture / replacement helpers                              |   | 0.85  |        |                           |                   | -                            |
|             | Feeder cattle   |   | 1.10  |        |                           |                   | -                            |
| Pigs        | Sows - farrow to finish (234 - 254 lbs)                           |   |       | 2.30   |                           |                   | -                            |
|             | Sows - farrow to wean (up to 11 lbs)                              |   |       | 1.00   |                           |                   | -                            |
|             | Sows - farrow to nursery (51 lbs)                                 |   |       | 0.80   |                           |                   | -                            |
|             | Weanlings, Nursery (11 - 51 lbs) Grower / Finisher (51 - 249 lbs) |   |       | 0.10   |                           |                   | -                            |
|             |   |   |       | 0.25   |                           |                   | -                            |
|             |   | Storage Volume (ft <sup>3</sup> /year/bird space) |       |        | Number of Birds           |                   | (A x B)                      |
| Chickens    | Broilers - floor <sup>2</sup>                                     |   |       | 1.23   |                           |                   | -                            |
|             | Broiler breeders - floor <sup>2</sup>                             |   |       | 2.33   |                           |                   | -                            |
|             | Broiler breeder pullets - floor <sup>2</sup>                      |   |       | 0.98   |                           |                   | -                            |
|             | Roasters - floor <sup>2</sup>                                     |   |       | 1.16   |                           |                   | -                            |
|             | Layers - cage <sup>1</sup>  |   |       | 2.33   |                           |                   | -                            |
|             | Layers - floor <sup>3</sup>                                       |   |       | 1.69   |                           |                   | -                            |
|             | Layers - solid pack   |   |       |        |                           |                   | -                            |
|             | Pullets - cage <sup>1</sup>                                       |   |       | 0.70   |                           |                   | -                            |
|             | Pullets - floor <sup>2</sup>                                      |   |       | 0.74   |                           |                   | -                            |
|             | Pullets - solid pack  |   |       |        |                           |                   | -                            |
| Turkeys     | Broilers - floor <sup>2</sup>                                     |   |       | 2.85   |                           |                   | -                            |
|             | Heavy toms - floor <sup>2</sup>                                   |   |       | 5.57   |                           |                   | -                            |
|             | Heavy hens - floor <sup>2</sup>                                   |   |       | 3.31   |                           |                   | -                            |

144153 / x 6.24  
 = 8.995  
 million  
 Imp gallons

- solid manure calculation on following page

1 Manure removed from barn at 90% moisture content with a density of 2,094 lbs/35 ft<sup>3</sup>.  
 2 50 mm wood shavings or 100 mm of straw placed on floor. Manure and litter removed from barn at 25% moisture content, with a density of 705 lbs/ft<sup>3</sup>.  
 3 One-third litter floor, two-thirds slatted floor. Manure and litter removed from barn at 40% moisture content, with a density of 881 lbs/ft<sup>3</sup>.

## Manure Storage Calculation

|                | Solid<br>Manure | Liquid<br>Manure |
|----------------|-----------------|------------------|
| Lactating      | 0               | 933              |
| Dry Cows       | 100             | 47               |
| Heifers (0-3)  | 182             |                  |
| Heifers (4-13) | 112             | 300              |
| Heifers (>13)  |                 | 380              |

210 animal units will be on solid manure and 1776.6 animal units are on liquid manure. (of 1986.6 animal units figured out using the second animal unit breakout page attached earlier in document)

Or 10.6 % are on solid manure and 89.4% on liquid manure.

As per Gary Plohman's email:

### Liquid Manure:

$4.0 \text{ cu ft/day} \times (933+47) = 3920 \text{ cu ft/day} \times 400 \text{ days} = 1568000 \times 6.24 = 9.78 \text{ million gallons of liquid manure.}$  (although some of the dry cows are solid)

### Solid Manure: (see Farm Practice Guidelines for Dairy - attached)

Dry Cow =  $100 \times 1.7 \text{ cu ft/day} \times 365 = 62050 \text{ cu ft/year}$  to be field stored

Heifer 0-13 months =  $294 \times .6 \text{ cu ft/day} \times 365 \text{ days} = 64386 \text{ cu ft/year}$  to be field stored (over estimated for heifer 0-3 months as FPG does not contain a separate number for this animal group)

Total =  $62050 + 64386 = 126436 \text{ cu ft/year}$

### Treatment System:

In addition Bronson is looking to implement a Bedding Recovery Unit into the operation. This system will further reduce the liquid entering the liquid manure storage and create bedding.

### Available Manure Storage:

**Earthen Manure Storage:**  $1409431.8 \text{ cu ft} \times 6.24 = 8794854 \text{ Imp gallons}$

**1996 barn pit:**  $200' \times 126' \times 8' = 201600 \text{ cu ft} \times 6.24 = 1257984 \text{ Imp gallons}$

**Main Barn pit:**  $200' \times 48' \times 8' = 76800 \text{ cu ft} \times 6.24 = 479232 \text{ Imp gallons}$

Total Liquid Storage = 10,532,070 Imp Gallons

If all storages are used this site has  $(400 \times 10.53) / 9.78 = 430$  days of liquid storage using 4 cu ft / cow.

## APPENDIX E

### Annual Livestock Manure Production

**TABLE E.1**

Annual Manure Production for Dairy Operations  
Litres/Day (Ft<sup>3</sup>/Day)

#### I. Free Stall

| Dairy Type                 | Storage Volume/Cow in Litres/Day<br>(and Cubic Feet/Day in Parenthesis) |             |             |
|----------------------------|---|-------------|-------------|
|                            | Solid Manure Handling *   |             |             |
|                            | Semi-Solid  | = Solid     | + Liquid    |
| Cow                        | 62<br>(2.2)   | 48<br>(1.7) | 14<br>(0.5) |
| Heifer<br>0-3 mo           | 5<br>(0.2)  |             |             |
| Heifer<br>4-13 mo          | 20<br>(0.7)   | 17<br>(0.6) | 3<br>(0.1)  |
| Heifer<br>13+ mo           | 31<br>(1.1)   | 23<br>(0.8) | 8<br>(0.3)  |
| Milk Centre/Milking<br>Cow | 14<br>(0.5)   |             | 14<br>(0.5) |

\* When manure is handled as a solid there is a liquid portion (urine + flush water) that may need to be stored.

Source: Farm Practices Guidelines for Dairy Producers in Manitoba.

## II. Tie Stall

| Dairy Type                 | Storage Volume/Cow in Litres/Day<br>(and Cubic Feet/Day in Parenthesis) |             |             |
|----------------------------|---|-------------|-------------|
|                            | Solid Manure Handling *   |             |             |
|                            | Semi-Solid  | = Solid     | + Liquid    |
| Cow                        | 65<br>(2.3)   | 51<br>(1.8) | 14<br>(0.5) |
| Heifer<br>0-3 mo           | 5<br>(0.2)  |             |             |
| Heifer<br>4-13 mo          | 20<br>(0.7)   | 17<br>(0.6) | 3<br>(0.1)  |
| Heifer<br>13+ mo           | 31<br>(1.1)   | 23<br>(0.8) | 8<br>(0.3)  |
| Milk Centre/Milking<br>Cow | 14<br>(0.5)   |             | 14<br>(0.5) |

\* When manure is handled as a solid there is a liquid portion (urine + flush water) that may need to be stored.

Source: Farm Practices Guidelines for Dairy Producers in Manitoba.

## II. Loose Housing

| Dairy Type              | Storage Volume/Cow in Litres/Day (and Cubic<br>Feet/Day in Parenthesis) |             |             |
|-------------------------|---|-------------|-------------|
|                         | Solid Manure Handling *   |             |             |
|                         | Semi-Solid  | = Solid     | + Liquid    |
| Cow                     |   | 57<br>(2.0) |             |
| Heifer<br>0-3 mo        |   |             |             |
| Heifer<br>4-13 mo       |   | 17<br>(0.6) |             |
| Heifer<br>13+ mo        |   | 23<br>(0.8) |             |
| Milk Centre/Milking Cow |   |             | 14<br>(0.5) |

\* When manure is handled as a solid there is a liquid portion (urine + flush water) that may need to be stored.

Source: Farm Practices Guidelines for Dairy Producers in Manitoba.

### Existing and Proposed Manure Storage Facility Dimension Tables

If applicable, indicate the dimensions of any existing manure storage facility (MSF) that will be used to store manure from the proposed project:

#### Existing Manure Storage Facility Dimensions

| CELL          | Width  | Length   | Depth  | Height<br>(Above Grade) | Slope (H:L) |         | Storage Capacity<br>(days) |
|---------------|--------|----------|--------|-------------------------|-------------|---------|----------------------------|
|               |        |          |        |                         | Inside      | Outside |                            |
| Primary       | 236 ft | 611 ft   | 13 ft  | 2 ft                    | 3.5:1       |         | 400 <sup>+</sup>           |
| Secondary     | ft     | ft       | ft     | ft                      |             |         |                            |
| Tertiary      | ft     | ft       | ft     | ft                      |             |         |                            |
|               |        | Diameter | Height | Depth                   |             |         |                            |
|               |        |          |        | (Above Grade)           |             |         |                            |
| Circular Tank |        | ft       | ft     | ft                      |             |         |                            |

Permit/Registration # 01-01-001

*- manure storage was built for 1000 milking cows in 2001.*

#### Existing Manure Storage Facility Dimensions

| CELL                              | Width  | Length   | Depth  | Height<br>(Above Grade) | Slope (H:L) |         | Storage Capacity<br>(days) |
|-----------------------------------|--------|----------|--------|-------------------------|-------------|---------|----------------------------|
|                                   |        |          |        |                         | Inside      | Outside |                            |
| 1996 barn<br>main barn<br>Primary | 200 ft | 126 ft   | 8 ft   | ft                      |             |         |                            |
| Secondary                         | 200 ft | 48 ft    | 8 ft   | ft                      |             |         |                            |
| Tertiary                          | ft     | ft       | ft     | ft                      |             |         |                            |
|                                   |        | Diameter | Height | Depth                   |             |         |                            |
| Circular Tank                     |        | ft       | ft     | ft                      |             |         |                            |

Permit/Registration # LR-0444

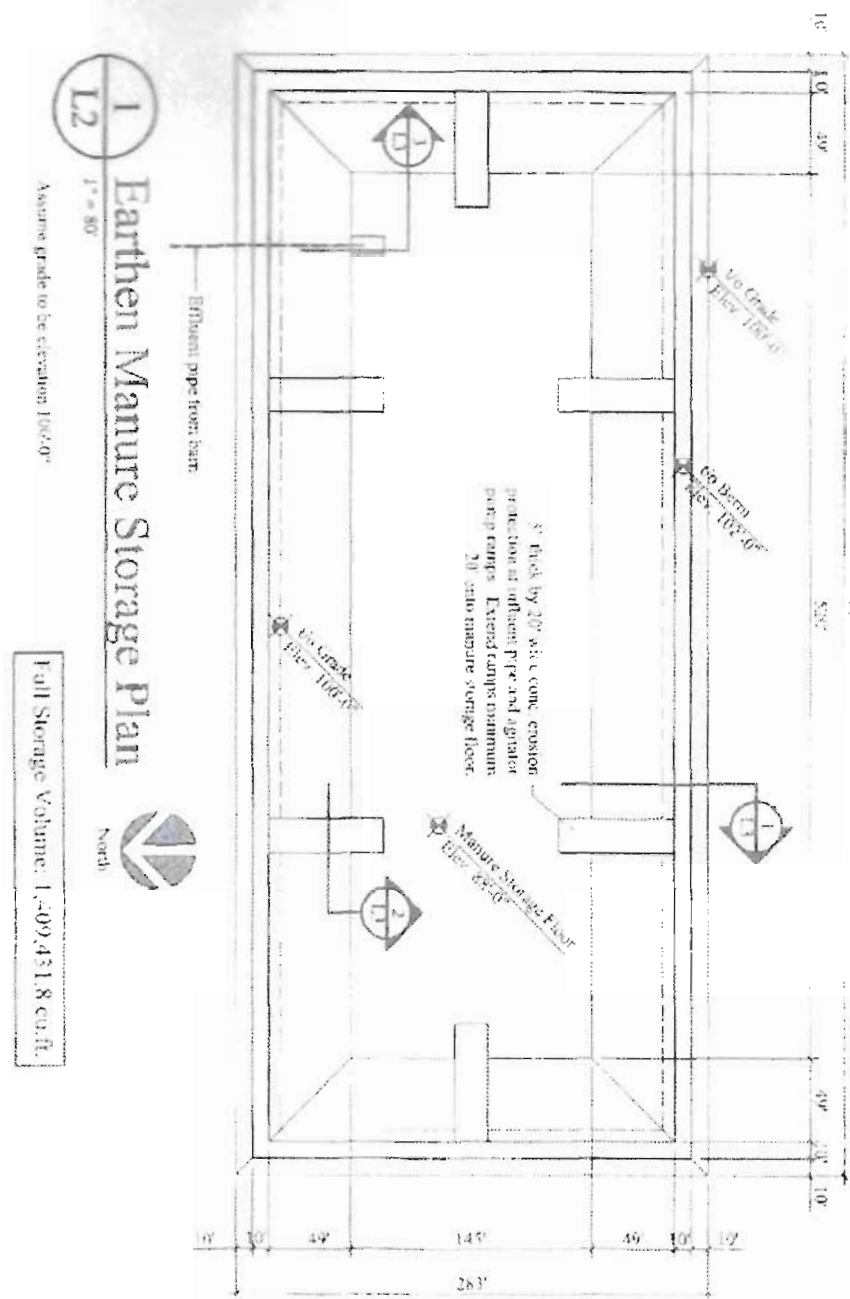
If available, indicate the dimensions of any proposed manure storage facility (MSF) that will be used to store manure from the proposed project:

| Proposed Manure Storage Facility |       |          |        |                         |             |         |                               |
|----------------------------------|-------|----------|--------|-------------------------|-------------|---------|-------------------------------|
| Dimensions                       |       |          |        |                         |             |         |                               |
| CELL                             | Width | Length   | Depth  | Height<br>(Above Grade) | Slope (H:L) |         | Storage<br>Capacity<br>(days) |
|                                  |       |          |        |                         | Inside      | Outside |                               |
| <b>Primary</b>                   | ft    | ft       | ft     | ft                      |             |         |                               |
| <b>Secondary</b>                 | ft    | ft       | ft     | ft                      |             |         |                               |
| <b>Tertiary</b>                  | ft    | ft       | ft     | ft                      |             |         |                               |
|                                  |       | Diameter | Height | Depth                   |             |         |                               |
| <b>Circular Tank</b>             |       | ft       | ft     | ft                      |             |         |                               |

The construction, modification or expansion of any manure storage structure requires a permit from Manitoba Conservation as per the *Livestock Manure and Mortalities Management Regulation (M.R. 42/98)*.

For Bedding Recovery Unit "BRU"

- a 75' wide x 56' deep (width) separated solid storage building
- 24' x 32' x 10' deep manure reception pit will also be a part of this structure.



|   |                               |   |
|---|-------------------------------|---|
|  <p>Box 25, 1072th Street<br/>Brandon, Manitoba<br/>CANADA R7M 4K0<br/>1-204-736-1721 Fax: (204) 526-1411<br/>Toll free: (800) 461-9117<br/>www.PenforConstruction.com</p> | <p>DATE: 03/12/2001</p>       |  |
|   | <p>SCALE: As noted</p>        |   |
| <p>PROJECT: PC-0102</p>   |                               |   |
| <p>DESIGNED BY: Sean Lepper, E.I.T.</p>   |                               |   |
| <p>PROJECT: Earthen Manure Storage<br/>Bronson Dairy - Landmark, Manitoba<br/>R.M. of Tache - Legal Description: NE 09-08-SE</p>  | <p>REVISIONS:<br/>RMD 1-2</p> |   |





**Elite Swine Inc.**

Richard Rentz, P.Eng.  
Regional Engineer  
MB Conservation  
P.O. Box 21450  
Steinbach, MB  
R0A 2T3

*RRR*

FAX 326-2472

September 20, 2001

Dear Richard:

Re: Bronson Dairy - Earthen Manure Storage Facility - NE 9-8-5E  
Permit # 01-01-001

As a registered professional engineer in the province of Manitoba, I hereby certify that the earthen manure storage located at Bronson Dairy has been completed according to plans submitted and according to the requirements of the Livestock Manure and Mortalities Management Regulation M.R. 42/98.

All appurtenances have been installed.

I trust this is the information you require. Please contact me if you wish to discuss this matter further.

Sincerely,

Gary Plohman, P. Eng  
Elite Swine Inc.



*Currently registered as  
LM-444*

Manitoba



**Conservation**

Environmental Operations  
123 Main Street, Suite 160  
Winnipeg, Manitoba R3C 1A5  
T 945-7100 F 948-2338

May 20, 2010

Mr. Russell Braun  
Bronson Dairy  
Box 48, RR1  
Landmark MB R0A 0X0

Dear Mr. Braun:

**Re: Bronson Dairy, LR-104-018 - Application for Registration of a Concrete Manure Storage Facility  
NE-09-08-05EPM, Rural Municipality of Tache**

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This correspondence is in response to your application for registration of a concrete livestock manure storage facility located on NE-09-08-05 EPM in the Rural Municipality of Tache. We have reviewed your application and our response is based on information provided on your registration application form, geotechnical characteristics at the site, and observations made during our site assessment.

Information received from you and our review and observations have satisfied us that your facility can be registered. Consequently, your concrete livestock manure storage facility is now formally registered and has been assigned a facility registration number. The registration number for this facility is **LR-0444**.

While your concrete livestock manure storage facility is now registered, this registration does not imply that the manure storage facility meets current construction standards as required by the *Livestock Manure and Mortalities Management Regulation*, nor does it mean that any prior environmental impact has been corrected. The registration of a livestock manure storage facility confirms that deficiencies identified during the review process have been corrected. In addition, modifications or repairs may be required in the future if subsequent inspections or new information highlight additional or new deficiencies.

Please note that land located Red River Valley Special Management Area (SMA, Section 14.1 of the Regulation) is subject to restrictions for fall manure spreading. Winter spreading will not be allowed after November 10, 2013 in all areas of the Province.

Should you have any questions, please do not hesitate to contact the District Supervisor at (204) 346-6060.

Yours sincerely,

A handwritten signature in blue ink, appearing to read "Don Labossiere", is written over a light blue rectangular background.

Don Labossiere  
Director, Environmental Operations

c: Sarah Belisle  
Environmental Engineering Section  
Rural Municipality of Tache **By Fax: 204-878-9977**

VOLUME DETERMINATION OF EARLIER MANURE STORAGE

|               |               |                |            |                 |                 |
|---------------|---------------|----------------|------------|-----------------|-----------------|
| NAME          | Bronson Dairy |                |            | Phone:          | 204-4123        |
| ADDRESS       | See Below     |                |            | Fax:            | 204-9276        |
|               |               |                |            | P. Code:        |                 |
| REG. NO.      |               | Original Date: |            | Revision Dates: |                 |
| LAND LOCATION | NE Quarter    | 9 Section      | 8 Township | 8 Range         | East Tache R.M. |

|                            |                 |                                     |                   |
|----------------------------|-----------------|-------------------------------------|-------------------|
| Required volume:           | 8,736,000 gal   | Full storage volume:                | 1,409,431.8 cu ft |
| Base length (Lb):          | 1,400,000 cu ft | Storage volume below grade:         | 1,269,184.0 cu ft |
| Base width (Wb):           | 520.0 ft        | Storage volume above grade:         | 141,247.8 cu ft   |
| Estimated storage depth:   | 145.0 ft        | Maximum storage volume:             | 1,553,509.7 cu ft |
| Depth below grade (Db):    | 13.0 ft         | no freeboard.                       |                   |
| Depth above grade (Da):    | 12.0 ft         | Volume of dike:                     | 65,450.0 cu ft    |
| Freeboard (Df):            | 1.0 ft          | Length at full supply level (Lfsl): | 511.0 ft          |
| Inside side slope - rise:  | 1.0             | Width at full supply level (Wfsl):  | 236.0 ft          |
| (S)                        | run: 3.5        | Length at ground level (Lg):        | 604.0 ft          |
| Outside side slope - rise: | 1.0             | Width at ground level (Wg):         | 229.0 ft          |
| (S)                        | run: 5.0        | Overall length (Lo):                | 658.0 ft          |
| Width of dike (Wd):        | 10.0 ft         | Overall width (Wo):                 | 283.0 ft          |

Volume of the Excavation: 1,269,184 cubic feet OR 46,969.3 cubic yards

Volume of the Dike: 65,450.0 cubic feet OR 2,424.1 cubic yards

SUMMARY OF CONSTRUCTION DIMENSIONS:

|        |           |        |           |      |          |
|--------|-----------|--------|-----------|------|----------|
| Lb =   | 520.0 ft. | Wb =   | 145.0 ft. | Wd = | 10.0 ft. |
| Lg =   | 604.0 ft. | Wg =   | 229.0 ft. | Da = | 1.0 ft.  |
| Lfsl = | 511.0 ft. | Wfsl = | 236.0 ft. | Db = | 12.0 ft. |
| Ltot = | 638.0 ft. | Wtot = | 263.0 ft. | Df = | 1.0 ft.  |
| Lc =   | 658.0 ft. | Wc =   | 283.0 ft. | B =  | 74.1 °   |
| Lfsl = | 511.0 ft. | Wfsl = | 236.0 ft. | A =  | 11.3 °   |

COMMENTS:

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FILE NAME: Bronson Dairy, Manure Storage  
 DATE: 03/26/01

ENGINEER: \_\_\_\_\_

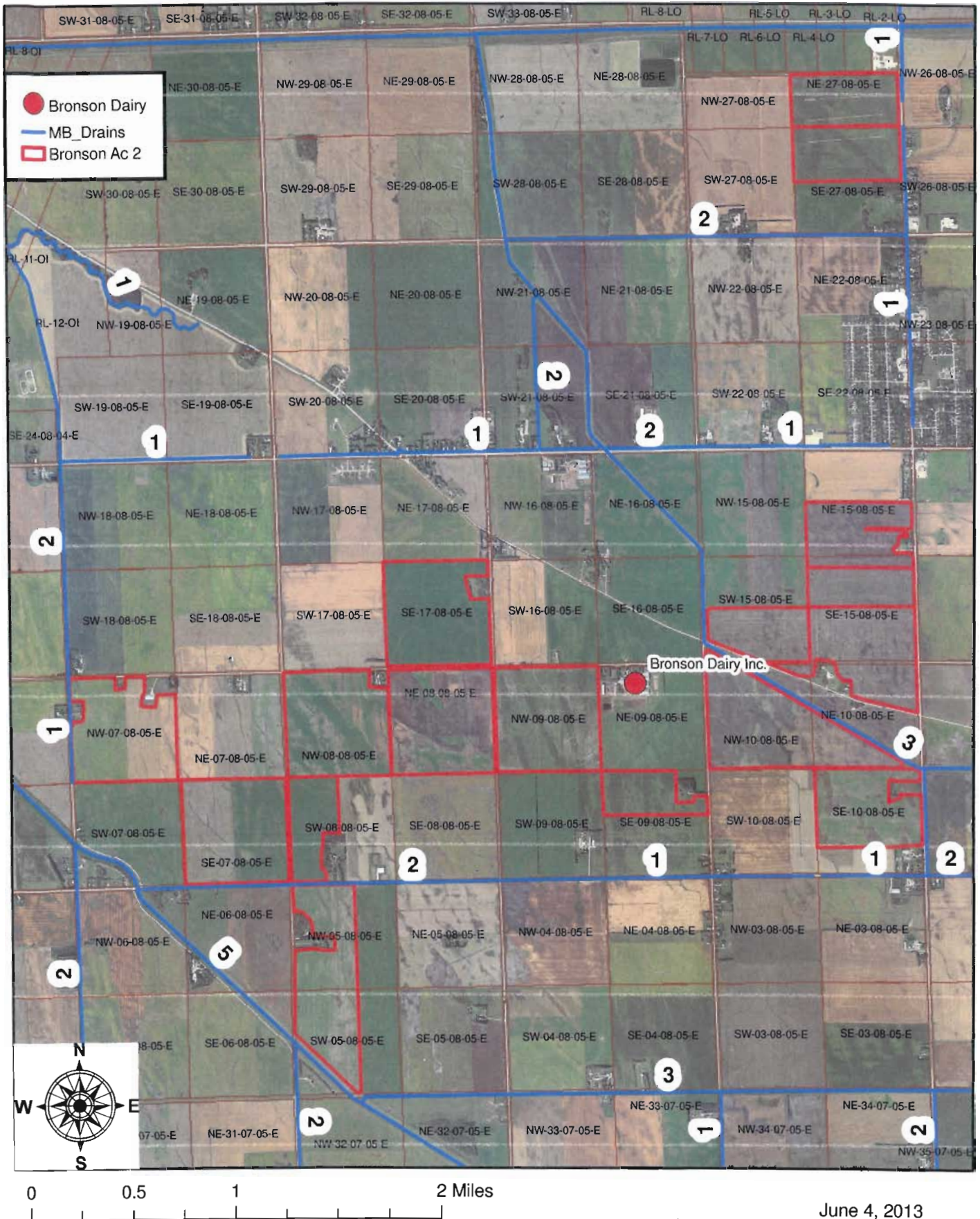
**Manure Application Field Characteristics Table**

| Field | Legal Description <sup>1</sup> | Municipality | O/L/A <sup>2</sup> | Acreage Available <sup>3</sup> | Features <sup>4</sup> | Expected Crop to be Grown (Historical Yield Average) | Soil Nitrate <sup>5,6</sup> | Soil Phosphorus <sup>5,7</sup> | Acreage Suitable for Manure Spreading <sup>8</sup> | Development Plan Designation <sup>9</sup> | Zoning <sup>10</sup> |
|-------|--------------------------------|--------------|--------------------|--------------------------------|-----------------------|--|-----------------------------|--------------------------------|--|---|----------------------|
| 1     | SE27-8-5e                      | Tache        | L/A                | 83                             | Dwelling/well(s)      | Corn   | 118                         | 44                             | 83   | General Ag. Area                          | AG                   |
| 2     | NE27-8-5e                      | Tache        | L/A                | 80                             |                       | alfalfa  | 18                          | 20                             | 80   | General Ag. Area                          | AG                   |
| 3     | NW9-8-5e                       | Tache        | O                  | 160                            |                       | alfalfa  | 35                          | 44                             | 160  | General Ag. Area                          | AG                   |
| 4     | NE8-8-5e                       | Tache        | O                  | 160                            | Dwelling/well(s)      | alfalfa  | 30                          | 46                             | 160  | General Ag. Area                          | AG                   |
| 5     | NW8-8-5e                       | Tache        | O                  | 156                            | Dwelling/well(s)      | Corn   | 95                          | 35                             | 156  | General Ag. Area                          | AG                   |
| 6     | SE17-8-5e                      | Tache        | O                  | 100                            |                       | alfalfa  | 41                          | 38                             | 100  | General Ag. Area                          | AG                   |
| 7     | SE9-8-5e                       | Tache        | O                  | 55                             | Dwelling/well(s)      | alfalfa  | 20                          | 31                             | 55   | General Ag. Area                          | AG                   |
| 8     | NW/SW5-8-5e                    | Tache        | O/L/A              | 153                            | Dwelling/well(s)      | alfalfa  | 17                          | 6                              | 153  | General Ag. Area                          | AG                   |
| 9     | NE15-8-5e                      | Tache        | O                  | 94                             | Dwelling/well(s)      | alfalfa  | 19                          | 22                             | 94   | General Ag. Area                          | AG                   |
| 10    | SE10-8-5e                      | Tache        | O                  | 113                            | Dwelling/well(s)      | alfalfa  | 52                          | 20                             | 113  | General Ag. Area                          | AG                   |
| 11    | SW8-8-5e                       | Tache        | O                  | 64                             | Dwelling/well(s)      | alfalfa  | 19                          | 12                             | 64   | General Ag. Area                          | AG                   |
| 12    | SE7-8-5e                       | Tache        | L/A                | 160                            |                       | Corn   | 97                          | 27                             | 160  | General Ag. Area                          | AG                   |
| 13    | NE/NW10-8-5e                   | Tache        | L/A                | 53                             | Dwelling/well(s)      | alfalfa  | 19                          | 12                             | 53   | General Ag. Area                          | AG                   |
| 14    | NW/NE10-8-5e                   | Tache        | O                  | 177                            |                       | Corn   | 115                         | 19                             | 177  | General Ag. Area                          | AG                   |
| 15    | NW7-8-5e                       | Tache        | O                  | 144                            | Dwelling (s) /well(s) | alfalfa  | 15                          | 44                             | 144  | General Ag. Area                          | AG                   |
| 16    | SE15-8-5e                      | Tache        | O                  | 60                             |                       | Corn   | 71                          | 4                              | 60   | General Ag. Area                          | AG                   |
| 17    | SW15-8-5e                      | Tache        | O                  | 72                             |                       | Alfalfa  | 19                          | 12                             | 72   | General Ag. Area                          | AG                   |
| 18    | SSE15-8-5e                     | Tache        | L/A                | 82                             |                       | Alfalfa  | 19                          | 12                             | 82   | General Ag. Area                          | AG                   |
| 19    | SE17-8-5e                      | Tache        | L/A                | 54                             |                       | Alfalfa  | 41                          | 38                             | 54   | General Ag. Area                          | AG                   |
| 20    | <b>TOTAL PROPOSED</b>          |              |                    |                                |                       |  |                             |                                |  | <b>TOTAL</b>                              |                      |
|       |                                |              |                    | 2020                           |                       |  |                             |                                | 2020   |   |                      |

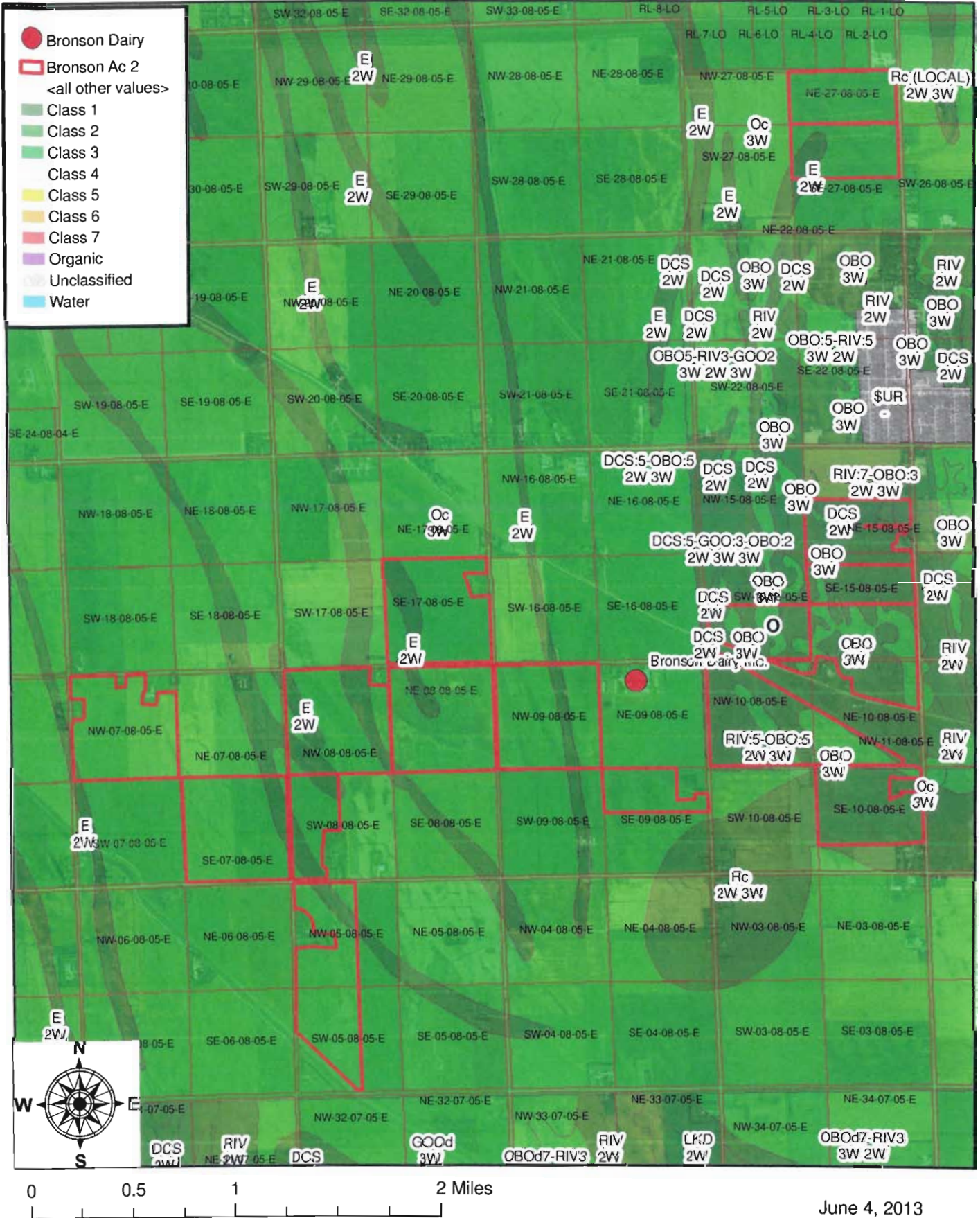
1. \_\_\_\_\_ Indicates Roll Number, Sec, Twshp, Rge or River Lot,  
 2. \_\_\_\_\_ Indicates how the land has been secured for spreading  
 3. \_\_\_\_\_ Acreage available should take into account setbacks from water courses, including ditches, property lines (refer to setback tables in the SA Guide)  
 4. \_\_\_\_\_ Features indicate any dwellings, other uses, wells (existing or abandoned), water bodies or other natural features within or adjacent to a spread field (note if any native habitat is proposed for manure application)  
 5. \_\_\_\_\_ Soil fertility analysis must be completed by an accredited soil-testing laboratory.  
 6. \_\_\_\_\_ Nitrate concentration N (lb/ac at 0-24 inch depth)  
 7. \_\_\_\_\_ Phosphorus concentration (ppm P at 0-6 inch depth)  
 8. \_\_\_\_\_ Suitable acreage is to be based on soil, crop and setback calculations  
 9. \_\_\_\_\_ Please reference the Development Plan for the designations  
 10. \_\_\_\_\_ Please reference the Zoning Bylaw of your municipality(ies)

SA Guide no available on web, used Regulation 42/98 Schedule C  
 "Setback requirements for Livestock Manure Application on Land adjacent to surface water or surface watercourse"

# Bronson Dairy Drain Order Map



# Bronson Dairy Ag. Capability Map



June 4, 2013



Soil Analysis by Agvise Laboratories  
 Northwood: (701) 587-6010  
 Benson: (320) 843-4109

### SOIL TEST REPORT

FIELD ID **2804**  
 SAMPLE ID  
 FIELD NAME **2s** *Fld 1*  
 COUNTY  
 TWP **SE27-8-5e**  
 SECTION **QTR** ACRES **82**  
 PREV. CROP **Corn-Silage**

SUBMITTED FOR:  
**Bronson Dairy**

SUBMITTED BY: **EL1911**  
**AGRA-GOLD CONSULTING LTD**  
**CLIFF LOEWEN**  
**BOX 156**  
**BLUMENORT, MB** **RDA 0C0**

REF # **427115** BOX # **0**  
 LAB # **NW71875**

Date Sampled **09/11/2012**

Date Received **09/12/2012**

Date Reported **2/6/2013**

| Nutrient In The Soil |                           | Interpretation |     |     |      | 1st Crop Choice               |                           | 2nd Crop Choice               |                        | 3rd Crop Choice                   |                     |                     |       |  |
|----------------------|---------------------------|----------------|-----|-----|------|-------------------------------|---------------------------|-------------------------------|------------------------|-----------------------------------|---------------------|---------------------|-------|--|
|                      |                           | VLow           | Low | Med | High | Wheat-Spring                  |                           |                               |                        |                                   |                     |                     |       |  |
|                      | 0-6" <b>67 lb/ac</b>      |                |     |     |      | YIELD GOAL                    |                           | YIELD GOAL                    |                        | YIELD GOAL                        |                     |                     |       |  |
|                      | 6-24" <b>51 lb/ac</b>     |                |     |     |      | 60                            | BU                        | 0                             |                        | 0                                 |                     |                     |       |  |
|                      | 0-24" <b>118 lb/ac</b>    |                |     |     |      | SUGGESTED GUIDELINES          |                           | SUGGESTED GUIDELINES          |                        | SUGGESTED GUIDELINES              |                     |                     |       |  |
| Nitrate              |                           |                |     |     |      | Band                          |                           | Band                          |                        | Band                              |                     |                     |       |  |
| Phosphorus           | Olsen <b>44 ppm</b>       |                |     |     |      | LB/ACRE                       | APPLICATION               | LB/ACRE                       | APPLICATION            | LB/ACRE                           | APPLICATION         |                     |       |  |
| Potassium            | <b>514 ppm</b>            |                |     |     |      | N                             | 44                        | N                             |                        | N                                 |                     |                     |       |  |
| Chloride             |                           |                |     |     |      | P <sub>2</sub> O <sub>5</sub> | 15 <b>Band (Starter)*</b> | P <sub>2</sub> O <sub>5</sub> |                        | P <sub>2</sub> O <sub>5</sub>     |                     |                     |       |  |
| Sulfur               | 0-6" <b>66 lb/ac</b>      |                |     |     |      | K <sub>2</sub> O              | 10 <b>Band (Starter)*</b> | K <sub>2</sub> O              |                        | K <sub>2</sub> O                  |                     |                     |       |  |
| Boron                | 6-24" <b>54 lb/ac</b>     |                |     |     |      | Cl                            |                           | Cl                            |                        | Cl                                |                     |                     |       |  |
| Zinc                 | <b>4.36 ppm</b>           |                |     |     |      | S                             | 0                         | S                             |                        | S                                 |                     |                     |       |  |
| Iron                 |                           |                |     |     |      | B                             |                           | B                             |                        | B                                 |                     |                     |       |  |
| Manganese            |                           |                |     |     |      | Zn                            | 0                         | Zn                            |                        | Zn                                |                     |                     |       |  |
| Copper               |                           |                |     |     |      | Fe                            |                           | Fe                            |                        | Fe                                |                     |                     |       |  |
| Magnesium            | <b>1294 ppm</b>           |                |     |     |      | Mn                            |                           | Mn                            |                        | Mn                                |                     |                     |       |  |
| Calcium              | <b>7086 ppm</b>           |                |     |     |      | Cu                            |                           | Cu                            |                        | Cu                                |                     |                     |       |  |
| Sodium               | <b>77 ppm</b>             |                |     |     |      | Mg                            | 0                         | Mg                            |                        | Mg                                |                     |                     |       |  |
| Org. Matter          | <b>7.7 %</b>              |                |     |     |      | Lime                          |                           | Lime                          |                        | Lime                              |                     |                     |       |  |
| Carbonate(CCE)       |                           |                |     |     |      | Soil pH                       | Buffer pH                 | Cation Exchange Capacity      |                        | % Base Saturation (Typical Range) |                     |                     |       |  |
| Soil Salts           | 0-6" <b>0.76 mmho/cm</b>  |                |     |     |      | 0-6" <b>7.6</b>               |                           | <b>47.9 meq</b>               | % Ca                   | % Mg                              | % K                 | % Na                | % H   |  |
|                      | 6-24" <b>0.81 mmho/cm</b> |                |     |     |      |                               |                           |                               | (65-75)<br><b>74.0</b> | (15-20)<br><b>22.5</b>            | (1-7)<br><b>2.8</b> | (0-5)<br><b>0.7</b> | (0-5) |  |

General Comments: Clays/Clay Loams (CEC range = 30+) (Fine)

Crop 1: \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 38 K2O = 23 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



Soil Analysis by **Agvise Laboratories**  
 Northwood: (701) 587-6010  
 Benson: (320) 843-4109

**SOIL TEST REPORT**

FIELD ID **2805**  
 SAMPLE ID  
 FIELD NAME **Zn** *Fld 2*  
 COUNTY  
 TWP **NE278-5e**  
 SECTION QTR ACRES **81**  
 PREV. CROP **Grass/Pasture**

SUBMITTED FOR:  
**Bronson Dairy**

SUBMITTED BY: **EL1911**  
**AGRA-GOLD CONSULTING LTD**  
**CLIFF LOEWEN**  
**BOX 156**  
**BLUMENORT, MB** **ROA 0C0**

REF # **544608** BOX # **0**  
 LAB # **NW172565**

Date Sampled: **10/26/2012** Date Received: **10/31/2012** Date Reported: **2/6/2013**

| Nutrient In The Soil |  | Interpretation |     |     |      | 1st Crop Choice               |                | 2nd Crop Choice               |                 | 3rd Crop Choice                   |              |              |       |  |
|----------------------|--|----------------|-----|-----|------|-------------------------------|----------------|-------------------------------|-----------------|-----------------------------------|--------------|--------------|-------|--|
|                      |  | VLow           | Low | Med | High |                               |                |                               |                 |                                   |              |              |       |  |
|                      |  |                |     |     |      | Grass/Pasture                 |                |                               |                 |                                   |              |              |       |  |
|                      |  |                |     |     |      | YIELD GOAL                    |                | YIELD GOAL                    |                 | YIELD GOAL                        |              |              |       |  |
|                      |  |                |     |     |      | 4 Tons                        |                | 0                             |                 | 0                                 |              |              |       |  |
|                      |  |                |     |     |      | SUGGESTED GUIDELINES          |                | SUGGESTED GUIDELINES          |                 | SUGGESTED GUIDELINES              |              |              |       |  |
|                      |  |                |     |     |      | Band                          |                |                               |                 |                                   |              |              |       |  |
|                      |  |                |     |     |      | LB/ACRE                       | APPLICATION    | LB/ACRE                       | APPLICATION     | LB/ACRE                           | APPLICATION  |              |       |  |
|                      |  |                |     |     |      | N                             | 102            | N                             |                 | N                                 |              |              |       |  |
|                      |  |                |     |     |      | P <sub>2</sub> O <sub>5</sub> | 0              | P <sub>2</sub> O <sub>5</sub> |                 | P <sub>2</sub> O <sub>5</sub>     |              |              |       |  |
|                      |  |                |     |     |      | K <sub>2</sub> O              | 0              | K <sub>2</sub> O              |                 | K <sub>2</sub> O                  |              |              |       |  |
|                      |  |                |     |     |      | Cl                            |                | Cl                            |                 | Cl                                |              |              |       |  |
|                      |  |                |     |     |      | S                             | 5 Band (Trial) | S                             |                 | S                                 |              |              |       |  |
|                      |  |                |     |     |      | B                             |                | B                             |                 | B                                 |              |              |       |  |
|                      |  |                |     |     |      | Zn                            | 0              | Zn                            |                 | Zn                                |              |              |       |  |
|                      |  |                |     |     |      | Fe                            |                | Fe                            |                 | Fe                                |              |              |       |  |
|                      |  |                |     |     |      | Mn                            |                | Mn                            |                 | Mn                                |              |              |       |  |
|                      |  |                |     |     |      | Cu                            |                | Cu                            |                 | Cu                                |              |              |       |  |
|                      |  |                |     |     |      | Mg                            | 0              | Mg                            |                 | Mg                                |              |              |       |  |
|                      |  |                |     |     |      | Lime                          |                | Lime                          |                 | Lime                              |              |              |       |  |
|                      |  |                |     |     |      | Soil pH                       | Buffer pH      | Cation Exchange Capacity      |                 | % Base Saturation (Typical Range) |              |              |       |  |
|                      |  |                |     |     |      |                               |                | % Ca                          | % Mg            | % K                               | % Na         | % H          |       |  |
|                      |  |                |     |     |      | 0-6"                          | 7.9            | 60.9 meq                      | (65-75)<br>70.0 | (15-20)<br>27.2                   | (1-7)<br>2.3 | (0-5)<br>0.4 | (0-5) |  |

General Comments: Texture is not estimated on high pH soils.  
 Crop 1: \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 48  
 K20 = 180 AGVISE Band guidelines will build P & K test levels to the medium range over many years.





Soil Analysis by Agvise Laboratories  
 Northwood: (701) 587-6010  
 Benson: (320) 843-4109

### SOIL TEST REPORT

FIELD ID **2807**  
 SAMPLE ID  
 FIELD NAME **4** *Fld 3*  
 COUNTY  
 TWP **NW9-8-5e**  
 SECTION **QTR** ACRES **195**  
 PREV. CROP **Grass/Pasture**

*was originally soil tested  
 in a 22 acre piece add'd  
 (cropped as one field) although  
 the extra 22 acres  
 is now not part of  
 this application.  
 (owned by different  
 farmer)*

SUBMITTED FOR:

**Bronson Dairy**

SUBMITTED BY: **EL1911**

**AGRA-GOLD CONSULTING LTD**  
**CLIFF LOEWEN**  
**BOX 156**  
**BLUMENORT, MB**      **ROA 0C0**

REF # **400707** BOX # **0**  
 LAB # **NW38740**

Date Sampled **07/24/2012**

Date Received **07/27/2012**

Date Reported **2/6/2013**

| Nutrient In The Soil |  | Interpretation |   |   |   | 1st Crop Choice                 |             | 2nd Crop Choice               |                 | 3rd Crop Choice                   |              |              |       |
|----------------------|--|----------------|---|---|---|---------------------------------|-------------|-------------------------------|-----------------|-----------------------------------|--------------|--------------|-------|
|                      |  | V              | L | M | H |                                 |             |                               |                 |                                   |              |              |       |
|                      |  |                |   |   |   | Grass/Pasture                   |             |                               |                 |                                   |              |              |       |
|                      |  |                |   |   |   | YIELD GOAL                      |             |                               |                 |                                   |              |              |       |
|                      |  |                |   |   |   | 4 Tons                          |             |                               |                 |                                   |              |              |       |
|                      |  |                |   |   |   | SUGGESTED GUIDELINES            |             |                               |                 |                                   |              |              |       |
|                      |  |                |   |   |   | Band                            |             |                               |                 |                                   |              |              |       |
|                      |  |                |   |   |   | LB/ACRE                         | APPLICATION | LB/ACRE                       | APPLICATION     | LB/ACRE                           | APPLICATION  |              |       |
|                      |  |                |   |   |   | N 85                            |             | N                             |                 | N                                 |              |              |       |
|                      |  |                |   |   |   | P <sub>2</sub> O <sub>5</sub> 0 |             | P <sub>2</sub> O <sub>5</sub> |                 | P <sub>2</sub> O <sub>5</sub>     |              |              |       |
|                      |  |                |   |   |   | K <sub>2</sub> O 0              |             | K <sub>2</sub> O              |                 | K <sub>2</sub> O                  |              |              |       |
|                      |  |                |   |   |   | Cl                              |             | Cl                            |                 | Cl                                |              |              |       |
|                      |  |                |   |   |   | S 0                             |             | S                             |                 | S                                 |              |              |       |
|                      |  |                |   |   |   | B                               |             | B                             |                 | B                                 |              |              |       |
|                      |  |                |   |   |   | Zn 0                            |             | Zn                            |                 | Zn                                |              |              |       |
|                      |  |                |   |   |   | Fe                              |             | Fe                            |                 | Fe                                |              |              |       |
|                      |  |                |   |   |   | Mn                              |             | Mn                            |                 | Mn                                |              |              |       |
|                      |  |                |   |   |   | Cu                              |             | Cu                            |                 | Cu                                |              |              |       |
|                      |  |                |   |   |   | Mg 0                            |             | Mg                            |                 | Mg                                |              |              |       |
|                      |  |                |   |   |   | Lime                            |             | Lime                          |                 | Lime                              |              |              |       |
|                      |  |                |   |   |   | Soil pH                         | Buffer pH   | Cation Exchange Capacity      |                 | % Base Saturation (Typical Range) |              |              |       |
|                      |  |                |   |   |   |                                 |             | % Ca                          | % Mg            | % K                               | % Na         | % H          |       |
|                      |  |                |   |   |   | 0-6" 8.1                        |             | 52.4 meq                      | (65-75)<br>65.7 | (15-20)<br>31.0                   | (1-7)<br>2.4 | (0-5)<br>0.9 | (0-5) |

General Comments: Texture is not estimated on high pH soils.

Crop 1: \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 48  
 K2O = 180 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



Soil Analysis by Agvise Laboratories  
 Northwood: (701) 587-6010  
 Benson: (320) 843-4109

### SOIL TEST REPORT

FIELD ID **2808**  
 SAMPLE ID  
 FIELD NAME **5** *Field #4*  
 COUNTY  
 TWP **NE8-8-5e**  
 SECTION QTR ACRES **160**  
 PREV. CROP **Grass/Pasture**

SUBMITTED FOR:  
**Bronson Dairy**

SUBMITTED BY: **EL1911**  
**AGRA-GOLD CONSULTING LTD**  
**CLIFF LOEWEN**  
**BOX 156**  
**BLUMENORT, MB** **ROA 0C0**

REP **544611** BOX # **0**  
 LAB **NW172585**

Date Sampled **10/26/2012**

Date Received **10/31/2012**

Date Reported **2/6/2013**

| Nutrient In The Soil |  | Interpretation |     |     |      | 1st Crop Choice               |             | 2nd Crop Choice               |                                   | 3rd Crop Choice               |              |              |       |
|----------------------|--|----------------|-----|-----|------|-------------------------------|-------------|-------------------------------|-----------------------------------|-------------------------------|--------------|--------------|-------|
|                      |  | VLow           | Low | Med | High |                               |             |                               |                                   |                               |              |              |       |
|                      |  |                |     |     |      | Grass/Pasture                 |             |                               |                                   |                               |              |              |       |
|                      |  |                |     |     |      | YIELD GOAL                    |             |                               |                                   |                               |              |              |       |
|                      |  |                |     |     |      | 4 Tons                        |             |                               |                                   |                               |              |              |       |
|                      |  |                |     |     |      | SUGGESTED GUIDELINES          |             |                               |                                   |                               |              |              |       |
|                      |  |                |     |     |      | Band                          |             |                               |                                   |                               |              |              |       |
|                      |  |                |     |     |      | LB/ACRE                       | APPLICATION | LB/ACRE                       | APPLICATION                       | LB/ACRE                       | APPLICATION  |              |       |
|                      |  |                |     |     |      | N                             | 0           | N                             |                                   | N                             |              |              |       |
|                      |  |                |     |     |      | P <sub>2</sub> O <sub>5</sub> | 0           | P <sub>2</sub> O <sub>5</sub> |                                   | P <sub>2</sub> O <sub>5</sub> |              |              |       |
|                      |  |                |     |     |      | K <sub>2</sub> O              | 0           | K <sub>2</sub> O              |                                   | K <sub>2</sub> O              |              |              |       |
|                      |  |                |     |     |      | Cl                            |             | Cl                            |                                   | Cl                            |              |              |       |
|                      |  |                |     |     |      | S                             | 0           | S                             |                                   | S                             |              |              |       |
|                      |  |                |     |     |      | B                             |             | B                             |                                   | B                             |              |              |       |
|                      |  |                |     |     |      | Zn                            | 0           | Zn                            |                                   | Zn                            |              |              |       |
|                      |  |                |     |     |      | Fe                            |             | Fe                            |                                   | Fe                            |              |              |       |
|                      |  |                |     |     |      | Mn                            |             | Mn                            |                                   | Mn                            |              |              |       |
|                      |  |                |     |     |      | Cu                            |             | Cu                            |                                   | Cu                            |              |              |       |
|                      |  |                |     |     |      | Mg                            | 0           | Mg                            |                                   | Mg                            |              |              |       |
|                      |  |                |     |     |      | Lime                          |             | Lime                          |                                   | Lime                          |              |              |       |
|                      |  |                |     |     |      | Soil pH                       | Buffer pH   | Cation Exchange Capacity      | % Base Saturation (Typical Range) |                               |              |              |       |
|                      |  |                |     |     |      |                               |             |                               | % Ca                              | % Mg                          | % K          | % Na         | % H   |
|                      |  |                |     |     |      | 0-6" 8.0                      |             | 51.3 meq                      | (65-75)<br>64.5                   | (15-20)<br>31.6               | (1-7)<br>3.2 | (0-5)<br>0.7 | (0-5) |

General Comments: Texture is not estimated on high pH soils.  
 Crop 1: \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 48  
 K2O = 180 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



Soil Analysis by Agvise Laboratories  
 Northwood: (701) 587-6010  
 Benson: (320) 843-4109

### SOIL TEST REPORT

FIELD ID: **2809**  
 SAMPLE ID: **F115**  
 FIELD NAME: **6**  
 COUNTY:   
 TWP: **NW8-8-5e**  
 SECTION: **QTR** ACRES: **157**  
 PREV. CROP: **Corn-Silage**

SUBMITTED FOR:  
**Bronson Dairy**

SUBMITTED BY: **EL1911**  
**AGRA-GOLD CONSULTING LTD**  
**CLIFF LOEWEN**  
**BOX 156**  
**BLUMENORT, MB** ROA OCO

REF # **422064** BOX # **0**  
 LAB # **NW65586**

Date Sampled: **09/05/2012**

Date Received: **09/07/2012**

Date Reported: **2/6/2013**

| Nutrient In The Soil |  | Interpretation |     |     |      | 1st Crop Choice               |             | 2nd Crop Choice               |                 | 3rd Crop Choice                   |              |              |       |
|----------------------|--|----------------|-----|-----|------|-------------------------------|-------------|-------------------------------|-----------------|-----------------------------------|--------------|--------------|-------|
|                      |  | VLow           | Low | Med | High | Corn-Silage                   |             |                               |                 |                                   |              |              |       |
|                      |  |                |     |     |      | YIELD GOAL                    |             | YIELD GOAL                    |                 | YIELD GOAL                        |              |              |       |
|                      |  |                |     |     |      | 20                            | Tons        | 0                             |                 | 0                                 |              |              |       |
|                      |  |                |     |     |      | SUGGESTED GUIDELINES          |             | SUGGESTED GUIDELINES          |                 | SUGGESTED GUIDELINES              |              |              |       |
|                      |  |                |     |     |      | Band                          |             | Band                          |                 | Band                              |              |              |       |
|                      |  |                |     |     |      | LB/ACRE                       | APPLICATION | LB/ACRE                       | APPLICATION     | LB/ACRE                           | APPLICATION  |              |       |
|                      |  |                |     |     |      | N                             | 113         | N                             |                 | N                                 |              |              |       |
|                      |  |                |     |     |      | P <sub>2</sub> O <sub>5</sub> | 15          | P <sub>2</sub> O <sub>5</sub> |                 | P <sub>2</sub> O <sub>5</sub>     |              |              |       |
|                      |  |                |     |     |      | K <sub>2</sub> O              | 10          | K <sub>2</sub> O              |                 | K <sub>2</sub> O                  |              |              |       |
|                      |  |                |     |     |      | Cl                            |             | Cl                            |                 | Cl                                |              |              |       |
|                      |  |                |     |     |      | S                             | 5           | S                             |                 | S                                 |              |              |       |
|                      |  |                |     |     |      | B                             |             | B                             |                 | B                                 |              |              |       |
|                      |  |                |     |     |      | Zn                            | 0           | Zn                            |                 | Zn                                |              |              |       |
|                      |  |                |     |     |      | Fe                            |             | Fe                            |                 | Fe                                |              |              |       |
|                      |  |                |     |     |      | Mn                            |             | Mn                            |                 | Mn                                |              |              |       |
|                      |  |                |     |     |      | Cu                            |             | Cu                            |                 | Cu                                |              |              |       |
|                      |  |                |     |     |      | Mg                            | 0           | Mg                            |                 | Mg                                |              |              |       |
|                      |  |                |     |     |      | Lime                          |             | Lime                          |                 | Lime                              |              |              |       |
|                      |  |                |     |     |      | Soil pH                       | Buffer pH   | Cation Exchange Capacity      |                 | % Base Saturation (Typical Range) |              |              |       |
|                      |  |                |     |     |      |                               |             | % Ca                          | % Mg            | % K                               | % Na         | % H          |       |
|                      |  |                |     |     |      | 0-6" 7.9                      |             | 49.6 meq                      | (65-75)<br>65.5 | (15-20)<br>31.4                   | (1-7)<br>2.5 | (0-5)<br>0.6 | (0-5) |

General Comments: Texture is not estimated on high pH soils.

Crop 1: \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 72 K20 = 166 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



Soil Analysis by Agvise Laboratories  
 Northwood: (701) 587-6010  
 Benson: (320) 843-4109

**SOIL TEST REPORT**

FIELD ID **2810**  
 SAMPLE ID  
 FIELD NAME **7** *Fl 6+19*  
 COUNTY  
 TWP **SE17-8-5e**  
 SECTION **QTR** ACRES **155**  
 PREV. CROP **Grass/Pasture**

SUBMITTED FOR:  
**Bronson Dairy**

SUBMITTED BY: **EL1911**  
**AGRA-GOLD CONSULTING LTD**  
**CLIFF LOEWEN**  
**BOX 156**  
**BLUMENORT, MB** **ROA 0C0**

REF # **400708** BOX # **0**  
 LAB # **NW38736**

Date Sampled **07/24/2012** Date Received **07/27/2012** Date Reported **2/6/2013**

| Nutrient In The Soil |                                  | Interpretation |     |     |      | 1st Crop Choice                 |           | 2nd Crop Choice               |                      | 3rd Crop Choice                   |                  |                   |           |  |
|----------------------|----------------------------------|----------------|-----|-----|------|---------------------------------|-----------|-------------------------------|----------------------|-----------------------------------|------------------|-------------------|-----------|--|
|                      |                                  | VLow           | Low | Med | High |                                 |           |                               |                      |                                   |                  |                   |           |  |
| Nitrate              | 0-6" 32 lb/ac                    |                |     |     |      | Grass/Pasture                   |           |                               |                      |                                   |                  |                   |           |  |
|                      | 6-24" 9 lb/ac                    |                |     |     |      | YIELD GOAL                      |           |                               |                      |                                   |                  |                   |           |  |
|                      | 0-24" 41 lb/ac                   |                |     |     |      | 4 Tons                          |           | 0                             |                      | 0                                 |                  |                   |           |  |
|                      |                                  |                |     |     |      | SUGGESTED GUIDELINES            |           | SUGGESTED GUIDELINES          |                      | SUGGESTED GUIDELINES              |                  |                   |           |  |
| Olsen Phosphorus     | 38 ppm                           |                |     |     |      | Band                            |           |                               |                      |                                   |                  |                   |           |  |
| Potassium            | 484 ppm                          |                |     |     |      | LB/ACRE APPLICATION             |           | LB/ACRE APPLICATION           |                      | LB/ACRE APPLICATION               |                  |                   |           |  |
| Chloride             |                                  |                |     |     |      | N 79                            |           | N                             |                      | N                                 |                  |                   |           |  |
| Sulfur               | 0-6" 24 lb/ac<br>6-24" 216 lb/ac |                |     |     |      | P <sub>2</sub> O <sub>5</sub> 0 |           | P <sub>2</sub> O <sub>5</sub> |                      | P <sub>2</sub> O <sub>5</sub>     |                  |                   |           |  |
| Boron                |                                  |                |     |     |      | K <sub>2</sub> O 0              |           | K <sub>2</sub> O              |                      | K <sub>2</sub> O                  |                  |                   |           |  |
| Zinc                 | 2.58 ppm                         |                |     |     |      | Cl                              |           | Cl                            |                      | Cl                                |                  |                   |           |  |
| Iron                 |                                  |                |     |     |      | S 0                             |           | S                             |                      | S                                 |                  |                   |           |  |
| Manganese            |                                  |                |     |     |      | B                               |           | B                             |                      | B                                 |                  |                   |           |  |
| Copper               |                                  |                |     |     |      | Zn 0                            |           | Zn                            |                      | Zn                                |                  |                   |           |  |
| Magnesium            | 1941 ppm                         |                |     |     |      | Fe                              |           | Fe                            |                      | Fe                                |                  |                   |           |  |
| Calcium              | 6912 ppm                         |                |     |     |      | Mn                              |           | Mn                            |                      | Mn                                |                  |                   |           |  |
| Sodium               | 93 ppm                           |                |     |     |      | Cu                              |           | Cu                            |                      | Cu                                |                  |                   |           |  |
| Org. Matter          | 5.5 %                            |                |     |     |      | Mg 0                            |           | Mg                            |                      | Mg                                |                  |                   |           |  |
| Carbonate(CCE)       |                                  |                |     |     |      | Lime                            |           | Lime                          |                      | Lime                              |                  |                   |           |  |
| Sol. Salts           | 0-6" 0.8 mmho/cm                 |                |     |     |      | Soil pH                         | Buffer pH | Cation Exchange Capacity      |                      | % Base Saturation (Typical Range) |                  |                   |           |  |
|                      | 6-24" 0.66 mmho/cm               |                |     |     |      | 0-6" 8.0                        |           | 52.4 meq                      | % Ca (65-75)<br>66.0 | % Mg (15-20)<br>30.9              | % K (1-7)<br>2.4 | % Na (0-5)<br>0.8 | % H (0-5) |  |

General Comments: Texture is not estimated on high pH soils.  
 Crop 1: \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 48  
 K2O = 180 A GVISE Band guidelines will build P & K test levels to the medium range over many years.



Soil Analysis by Agvise Laboratories  
 Northwood: (701) 587-6010  
 Benson: (320) 843-4109

**SOIL TEST REPORT**

FIELD ID: 2812  
 SAMPLE ID: **FLD 7**  
 FIELD NAME: 9  
 COUNTY:  
 TWP: SE9-8-5e  
 SECTION: QTR ACRES: 55  
 PREV. CROP: Grass/Pasture

SUBMITTED FOR:  
**Bronson Dairy**

SUBMITTED BY: EL1911  
**AGRA-GOLD CONSULTING LTD**  
**CLIFF LOEWEN**  
**BOX 156**  
**BLUMENORT, MB** RDA 0C0

REF #: 544610 BOX 0  
 LAB #: NW172589

Date Sampled 10/26/2012 Date Received 10/31/2012 Date Reported 2/6/2013

| Nutrient In The Soil |  | Interpretation |     |     |      | 1st Crop Choice               |             | 2nd Crop Choice               |                 | 3rd Crop Choice                   |              |              |       |  |
|----------------------|--|----------------|-----|-----|------|-------------------------------|-------------|-------------------------------|-----------------|-----------------------------------|--------------|--------------|-------|--|
|                      |  | VLow           | Low | Med | High |                               |             |                               |                 |                                   |              |              |       |  |
|                      |  |                |     |     |      | Grass/Pasture                 |             |                               |                 |                                   |              |              |       |  |
|                      |  |                |     |     |      | YIELD GOAL                    |             | YIELD GOAL                    |                 | YIELD GOAL                        |              |              |       |  |
|                      |  |                |     |     |      | 4                             | Tons        | 0                             |                 | 0                                 |              |              |       |  |
|                      |  |                |     |     |      | SUGGESTED GUIDELINES          |             | SUGGESTED GUIDELINES          |                 | SUGGESTED GUIDELINES              |              |              |       |  |
|                      |  |                |     |     |      | Band                          |             | Band                          |                 | Band                              |              |              |       |  |
|                      |  |                |     |     |      | LB/ACRE                       | APPLICATION | LB/ACRE                       | APPLICATION     | LB/ACRE                           | APPLICATION  |              |       |  |
|                      |  |                |     |     |      | N                             | 100         | N                             |                 | N                                 |              |              |       |  |
|                      |  |                |     |     |      | P <sub>2</sub> O <sub>5</sub> | 0           | P <sub>2</sub> O <sub>5</sub> |                 | P <sub>2</sub> O <sub>5</sub>     |              |              |       |  |
|                      |  |                |     |     |      | K <sub>2</sub> O              | 0           | K <sub>2</sub> O              |                 | K <sub>2</sub> O                  |              |              |       |  |
|                      |  |                |     |     |      | Cl                            |             | Cl                            |                 | Cl                                |              |              |       |  |
|                      |  |                |     |     |      | S                             | 0           | S                             |                 | S                                 |              |              |       |  |
|                      |  |                |     |     |      | B                             |             | B                             |                 | B                                 |              |              |       |  |
|                      |  |                |     |     |      | Zn                            | 0           | Zn                            |                 | Zn                                |              |              |       |  |
|                      |  |                |     |     |      | Fe                            |             | Fe                            |                 | Fe                                |              |              |       |  |
|                      |  |                |     |     |      | Mn                            |             | Mn                            |                 | Mn                                |              |              |       |  |
|                      |  |                |     |     |      | Cu                            |             | Cu                            |                 | Cu                                |              |              |       |  |
|                      |  |                |     |     |      | Mg                            | 0           | Mg                            |                 | Mg                                |              |              |       |  |
|                      |  |                |     |     |      | Lime                          |             | Lime                          |                 | Lime                              |              |              |       |  |
|                      |  |                |     |     |      | Soil pH                       | Buffer pH   | Cation Exchange Capacity      |                 | % Base Saturation (Typical Range) |              |              |       |  |
|                      |  |                |     |     |      | % Ca                          | % Mg        | % K                           | % Na            | % H                               |              |              |       |  |
|                      |  |                |     |     |      | 0-6" 7.9                      |             | 49.4 meq                      | (65-75)<br>64.1 | (15-20)<br>32.4                   | (1-7)<br>2.9 | (0-5)<br>0.6 | (0-5) |  |

General Comments: Texture is not estimated on high pH soils.  
 Crop 1: \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 48  
 K2O = 180 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



Soil Analysis by **Agvise Laboratories**  
 Northwood: (701) 587-6010  
 Benson: (320) 843-4109

### SOIL TEST REPORT

FIELD ID **2814**  
 SAMPLE ID **Field 8**  
 FIELD NAME **11**  
 COUNTY  
 TWP **NWSW5-8-5e W**  
 SECTION QTR ACRES **165**  
 PREV. CROP **Grass/Pasture**

SUBMITTED FOR:  
**Bronson Dairy**

SUBMITTED BY: **EL1911**  
**AGRA-GOLD CONSULTING LTD**  
**CLIFF LOEWEN**  
**BOX 156**  
**BLUMENORT, MB** ROA 0C0

REF # **400709** BOX # **0**  
 LAB # **NW38739**

Date Sampled **07/24/2012** Date Received **07/27/2012** Date Reported **2/6/2013**

| Nutrient In The Soil |  | Interpretation |     |     |      | 1st Crop Choice               |             | 2nd Crop Choice               |                 | 3rd Crop Choice                   |              |              |       |  |
|----------------------|--|----------------|-----|-----|------|-------------------------------|-------------|-------------------------------|-----------------|-----------------------------------|--------------|--------------|-------|--|
|                      |  | VLow           | Low | Med | High |                               |             |                               |                 |                                   |              |              |       |  |
|                      |  |                |     |     |      | Grass/Pasture                 |             |                               |                 |                                   |              |              |       |  |
|                      |  |                |     |     |      | YIELD GOAL                    |             | YIELD GOAL                    |                 | YIELD GOAL                        |              |              |       |  |
|                      |  |                |     |     |      | 4                             | Tons        | 0                             |                 | 0                                 |              |              |       |  |
|                      |  |                |     |     |      | SUGGESTED GUIDELINES          |             | SUGGESTED GUIDELINES          |                 | SUGGESTED GUIDELINES              |              |              |       |  |
|                      |  |                |     |     |      | Band                          |             | Band                          |                 | Band                              |              |              |       |  |
|                      |  |                |     |     |      | LB/ACRE                       | APPLICATION | LB/ACRE                       | APPLICATION     | LB/ACRE                           | APPLICATION  |              |       |  |
|                      |  |                |     |     |      | N                             | 103         | N                             |                 | N                                 |              |              |       |  |
|                      |  |                |     |     |      | P <sub>2</sub> O <sub>5</sub> | 33 Band *   | P <sub>2</sub> O <sub>5</sub> |                 | P <sub>2</sub> O <sub>5</sub>     |              |              |       |  |
|                      |  |                |     |     |      | K <sub>2</sub> O              | 0           | K <sub>2</sub> O              |                 | K <sub>2</sub> O                  |              |              |       |  |
|                      |  |                |     |     |      | Cl                            |             | Cl                            |                 | Cl                                |              |              |       |  |
|                      |  |                |     |     |      | S                             | 0           | S                             |                 | S                                 |              |              |       |  |
|                      |  |                |     |     |      | B                             |             | B                             |                 | B                                 |              |              |       |  |
|                      |  |                |     |     |      | Zn                            | 0           | Zn                            |                 | Zn                                |              |              |       |  |
|                      |  |                |     |     |      | Fe                            |             | Fe                            |                 | Fe                                |              |              |       |  |
|                      |  |                |     |     |      | Mn                            |             | Mn                            |                 | Mn                                |              |              |       |  |
|                      |  |                |     |     |      | Cu                            |             | Cu                            |                 | Cu                                |              |              |       |  |
|                      |  |                |     |     |      | Mg                            | 0           | Mg                            |                 | Mg                                |              |              |       |  |
|                      |  |                |     |     |      | Lime                          |             | Lime                          |                 | Lime                              |              |              |       |  |
|                      |  |                |     |     |      | Soil pH                       | Buffer pH   | Cation Exchange Capacity      |                 | % Base Saturation (Typical Range) |              |              |       |  |
|                      |  |                |     |     |      |                               |             |                               | % Ca            | % Mg                              | % K          | % Na         | % H   |  |
|                      |  |                |     |     |      | 0-6" 8.1                      |             | 49.8 meq                      | (65-75)<br>67.6 | (15-20)<br>29.8                   | (1-7)<br>2.1 | (0-5)<br>0.5 | (0-5) |  |

General Comments: Texture is not estimated on high pH soils.  
 Crop 1: \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 48  
 K2O = 180 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



Soil Analysis by Agvise Laboratories  
 Northwood: (701) 587-6010  
 Benson: (320) 843-4109

**SOIL TEST REPORT**

FIELD ID: **2815**  
 SAMPLE ID:  
 FIELD NAME: **12** *Fld 9*  
 COUNTY:  
 TWP: **NE15-8-5e**  
 SECTION: **QTR** ACRES: **93**  
 PREV. CROP: **Grass/Pasture**

SUBMITTED FOR:  
**Bronson Dairy**

SUBMITTED BY: **EL1911**  
**AGRA-GOLD CONSULTING LTD**  
**CLIFF LOEWEN**  
**BOX 156**  
**BLUMENORT, MB** R0A 0C0

REF # **544607** 0  
 LAB # **NW172481**

Date Sampled: **10/26/2012**

Date Received: **10/31/2012**

Date Reported: **2/6/2013**

| Nutrient In The Soil |               | Interpretation              |       |     |      | 1st Crop Choice               |             | 2nd Crop Choice               |                                   | 3rd Crop Choice               |              |              |       |
|----------------------|---------------|-----------------------------|-------|-----|------|-------------------------------|-------------|-------------------------------|-----------------------------------|-------------------------------|--------------|--------------|-------|
|                      |               | VLow                        | Low   | Med | High |                               |             |                               |                                   |                               |              |              |       |
| Nitrate              | 0-6"          | 10 lb/ac                    |       |     |      | Grass/Pasture                 |             |                               |                                   |                               |              |              |       |
|                      | 6-24"         | 9 lb/ac                     | ****  |     |      | YIELD GOAL                    |             |                               |                                   |                               |              |              |       |
|                      | 0-24"         | 19 lb/ac                    |       |     |      | 4 Tons                        |             |                               |                                   |                               |              |              |       |
|                      |               |                             |       |     |      | SUGGESTED GUIDELINES          |             |                               |                                   |                               |              |              |       |
| Olsen Phosphorus     | 22 ppm        | *****                       |       |     |      | Band                          |             |                               |                                   |                               |              |              |       |
| Potassium            | 516 ppm       | *****                       |       |     |      | LB/ACRE                       | APPLICATION | LB/ACRE                       | APPLICATION                       | LB/ACRE                       | APPLICATION  |              |       |
| Chloride             |               |                             |       |     |      | N                             | 101         | N                             |                                   | N                             |              |              |       |
| Sulfur               | 0-6"<br>6-24" | 24 lb/ac<br>126 lb/ac       | ***** |     |      | P <sub>2</sub> O <sub>5</sub> | 0           | P <sub>2</sub> O <sub>5</sub> |                                   | P <sub>2</sub> O <sub>5</sub> |              |              |       |
| Boron                |               |                             |       |     |      | K <sub>2</sub> O              | 0           | K <sub>2</sub> O              |                                   | K <sub>2</sub> O              |              |              |       |
| Zinc                 | 2.63 ppm      | *****                       |       |     |      | Cl                            |             | Cl                            |                                   | Cl                            |              |              |       |
| Iron                 |               |                             |       |     |      | S                             | 0           | S                             |                                   | S                             |              |              |       |
| Manganese            |               |                             |       |     |      | B                             |             | B                             |                                   | B                             |              |              |       |
| Copper               |               |                             |       |     |      | Zn                            | 0           | Zn                            |                                   | Zn                            |              |              |       |
| Magnesium            | 1599 ppm      | *****                       |       |     |      | Fe                            |             | Fe                            |                                   | Fe                            |              |              |       |
| Calcium              | 5882 ppm      | *****                       |       |     |      | Mn                            |             | Mn                            |                                   | Mn                            |              |              |       |
| Sodium               | 58 ppm        | *****                       |       |     |      | Cu                            |             | Cu                            |                                   | Cu                            |              |              |       |
| Org. Matter          | 6.1 %         | *****                       |       |     |      | Mg                            | 0           | Mg                            |                                   | Mg                            |              |              |       |
| Carbonate(CCE)       |               |                             |       |     |      | Lime                          |             | Lime                          |                                   | Lime                          |              |              |       |
| Sol. Salts           | 0-6"<br>6-24" | 0.5 mmho/cm<br>0.68 mmho/cm | ***** |     |      | Soil pH                       | Buffer pH   | Cation Exchange Capacity      | % Base Saturation (Typical Range) |                               |              |              |       |
|                      |               |                             |       |     |      |                               |             |                               | % Ca                              | % Mg                          | % K          | % Na         | % H   |
|                      |               |                             |       |     |      | 0-6"                          | 7.8         | 44.3 meq                      | (65-75)<br>66.4                   | (15-20)<br>30.1               | (1-7)<br>3.0 | (0-5)<br>0.6 | (0-5) |

General Comments: Texture is not estimated on high pH soils.

Crop 1: \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 48 K2O = 180 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



Soil Analysis by **Agvise Laboratories**  
 Northwood: (701) 587-6010  
 Benson: (320) 843-4109

**SOIL TEST REPORT**

FIELD ID: **2817**  
 SAMPLE ID: **Field 10**  
 FIELD NAME: **14**  
 COUNTY: \_\_\_\_\_  
 TWP: **SE10-8-5e**  
 SECTION: \_\_\_\_\_ QTR: \_\_\_\_\_ ACRES: **110**  
 PREV. CROP: **Grass/Pasture**

SUBMITTED FOR:  
**Bronson Dairy**

SUBMITTED BY: **EL1911**  
**AGRA-GOLD CONSULTING LTD**  
**CLIFF LOEWEN**  
**BOX 156**  
**BLUMENORT, MB**                      **ROA 0C0**

REF # **400710**    BOX # **0**  
 LAB # **NW38731**

Date Sampled **07/24/2012**                      Date Received **07/27/2012**                      Date Reported **2/6/2013**

| Nutrient In The Soil |  | Interpretation |     |     |      | 1st Crop Choice               |             | 2nd Crop Choice               |                 | 3rd Crop Choice                   |              |              |       |
|----------------------|--|----------------|-----|-----|------|-------------------------------|-------------|-------------------------------|-----------------|-----------------------------------|--------------|--------------|-------|
|                      |  | VLow           | Low | Med | High |                               |             |                               |                 |                                   |              |              |       |
|                      |  |                |     |     |      | Grass/Pasture                 |             |                               |                 |                                   |              |              |       |
|                      |  |                |     |     |      | YIELD GOAL                    |             | YIELD GOAL                    |                 | YIELD GOAL                        |              |              |       |
|                      |  |                |     |     |      | 4                             | Tons        | 0                             |                 | 0                                 |              |              |       |
|                      |  |                |     |     |      | SUGGESTED GUIDELINES          |             | SUGGESTED GUIDELINES          |                 | SUGGESTED GUIDELINES              |              |              |       |
|                      |  |                |     |     |      | Band                          |             |                               |                 |                                   |              |              |       |
|                      |  |                |     |     |      | LB/ACRE                       | APPLICATION | LB/ACRE                       | APPLICATION     | LB/ACRE                           | APPLICATION  |              |       |
|                      |  |                |     |     |      | N                             | 68          | N                             |                 | N                                 |              |              |       |
|                      |  |                |     |     |      | P <sub>2</sub> O <sub>5</sub> | 0           | P <sub>2</sub> O <sub>5</sub> |                 | P <sub>2</sub> O <sub>5</sub>     |              |              |       |
|                      |  |                |     |     |      | K <sub>2</sub> O              | 0           | K <sub>2</sub> O              |                 | K <sub>2</sub> O                  |              |              |       |
|                      |  |                |     |     |      | Cl                            |             | Cl                            |                 | Cl                                |              |              |       |
|                      |  |                |     |     |      | S                             | 0           | S                             |                 | S                                 |              |              |       |
|                      |  |                |     |     |      | B                             |             | B                             |                 | B                                 |              |              |       |
|                      |  |                |     |     |      | Zn                            | 0           | Zn                            |                 | Zn                                |              |              |       |
|                      |  |                |     |     |      | Fe                            |             | Fe                            |                 | Fe                                |              |              |       |
|                      |  |                |     |     |      | Mn                            |             | Mn                            |                 | Mn                                |              |              |       |
|                      |  |                |     |     |      | Cu                            |             | Cu                            |                 | Cu                                |              |              |       |
|                      |  |                |     |     |      | Mg                            | 0           | Mg                            |                 | Mg                                |              |              |       |
|                      |  |                |     |     |      | Lime                          |             | Lime                          |                 | Lime                              |              |              |       |
|                      |  |                |     |     |      | Soil pH                       | Buffer pH   | Cation Exchange Capacity      |                 | % Base Saturation (Typical Range) |              |              |       |
|                      |  |                |     |     |      |                               |             | % Ca                          | % Mg            | % K                               | % Na         | % H          |       |
|                      |  |                |     |     |      | 0-6"                          | 7.9         | 55.0 meq                      | (65-75)<br>64.3 | (15-20)<br>32.8                   | (1-7)<br>2.0 | (0-5)<br>0.9 | (0-5) |

General Comments: Texture is not estimated on high pH soils.  
 Crop 1: \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 48 K2O = 180 AGVISE Band guidelines will build P & K test levels to the medium range over many years.





Soil Analysis by **Agvise Laboratories**  
 Northwood: (701) 587-6010  
 Benson: (320) 843-4109

**SOIL TEST REPORT**

FIELD ID: **2818**  
 SAMPLE ID: **Field 11**  
 FIELD NAME: **15**  
 COUNTY:  
 TWP: **SW8-8-5e**  
 SECTION: **QTR** ACRES: **60**  
 PREV. CROP: **Grass/Pasture**

SUBMITTED FOR:  
**Bronson Dairy**

SUBMITTED BY: **EL1911**  
**AGRA-GOLD CONSULTING LTD**  
**CLIFF LOEWEN**  
**BOX 156**  
**BLUMENORT, MB** ROA OCO

REF #: **400711** BOX #: **0**  
 LAB #: **NW38741**

Date Sampled: **07/24/2012** Date Received: **07/27/2012** Date Reported: **2/6/2013**

| Nutrient In The Soil |  | Interpretation |     |     |      | 1st Crop Choice                  |                          | 2nd Crop Choice                   |                 | 3rd Crop Choice               |              |       |
|----------------------|--|----------------|-----|-----|------|----------------------------------|--------------------------|-----------------------------------|-----------------|-------------------------------|--------------|-------|
|                      |  | VLow           | Low | Med | High |                                  |                          |                                   |                 |                               |              |       |
| Nitrate              | 0-6" 10 lb/ac                          |                |     |     |      | Grass/Pasture                    |                          |                                   |                 |                               |              |       |
|                      | 6-24" 9 lb/ac                          |                |     |     |      | YIELD GOAL                       |                          | YIELD GOAL                        |                 | YIELD GOAL                    |              |       |
|                      | 0-24" 19 lb/ac                         | ****           |     |     |      | 4 Tons                           | 0                        | 0                                 |                 |                               |              |       |
|                      |  |                |     |     |      | SUGGESTED GUIDELINES             |                          | SUGGESTED GUIDELINES              |                 | SUGGESTED GUIDELINES          |              |       |
|                      |  |                |     |     |      | Band                             |                          | Band                              |                 | Band                          |              |       |
| Phosphorus           | Olsen 12 ppm                           | *****          |     |     |      | LB/ACRE                          | APPLICATION              | LB/ACRE                           | APPLICATION     | LB/ACRE                       | APPLICATION  |       |
| Potassium            | 310 ppm                                | *****          |     |     |      | N 101                            |                          | N                                 |                 | N                             |              |       |
| Chloride             |  |                |     |     |      | P <sub>2</sub> O <sub>5</sub> 18 | Band *                   | P <sub>2</sub> O <sub>5</sub>     |                 | P <sub>2</sub> O <sub>5</sub> |              |       |
| Sulfur               | 0-6" 16 lb/ac<br>6-24" 312 lb/ac       | *****          |     |     |      | K <sub>2</sub> O 0               |                          | K <sub>2</sub> O                  |                 | K <sub>2</sub> O              |              |       |
| Boron                |  |                |     |     |      | Cl                               |                          | Cl                                |                 | Cl                            |              |       |
| Zinc                 | 2.02 ppm                               | *****          |     |     |      | S 0                              |                          | S                                 |                 | S                             |              |       |
| Iron                 |  |                |     |     |      | B                                |                          | B                                 |                 | B                             |              |       |
| Manganese            |  |                |     |     |      | Zn 0                             |                          | Zn                                |                 | Zn                            |              |       |
| Copper               |  |                |     |     |      | Fe                               |                          | Fe                                |                 | Fe                            |              |       |
| Magnesium            | 2079 ppm                               | *****          |     |     |      | Mn                               |                          | Mn                                |                 | Mn                            |              |       |
| Calcium              | 6609 ppm                               | *****          |     |     |      | Cu                               |                          | Cu                                |                 | Cu                            |              |       |
| Sodium               | 75 ppm                                 | *****          |     |     |      | Mg 0                             |                          | Mg                                |                 | Mg                            |              |       |
| Org.Matter           | 5.0 %                                  | *****          |     |     |      | Lime                             |                          | Lime                              |                 | Lime                          |              |       |
| Carbonate(CCE)       |  |                |     |     |      | Soil pH                          |                          | % Base Saturation (Typical Range) |                 |                               |              |       |
| Sol. Salts           | 0-6" 0.6 mmho/cm<br>6-24" 0.82 mmho/cm | *****          |     |     |      | Buffer pH                        | Cation Exchange Capacity | % Ca                              | % Mg            | % K                           | % Na         | % H   |
|                      |  |                |     |     |      | 0-6" 8.1                         | 51.5 meq                 | (65-75)<br>64.2                   | (15-20)<br>33.6 | (1-7)<br>1.5                  | (0-5)<br>0.6 | (0-5) |

General Comments: Texture is not estimated on high pH soils.  
 Crop 1: \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 48 K2O = 130 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



Soil Analysis by **Agvise Laboratories**  
 Northwood: (701) 587-6010  
 Benson: (320) 843-4109

**SOIL TEST REPORT**

FIELD ID: **2819**  
 SAMPLE ID:  
 FIELD NAME: **16** *Fld 12*  
 COUNTY:  
 TWP: **SE7-8-5e**  
 SECTION: QTR ACRES: **161**  
 PREV. CROP: **Corn-Silage**

SUBMITTED FOR:  
**Bronson Dairy**

SUBMITTED BY: **EL1911**  
**AGRA-GOLD CONSULTING LTD**  
**CLIFF LOEWEN**  
**BOX 156**  
**BLUMENORT, MB** ROA OCO

REF #: **422077** BOX: **0**  
 LAB #: **NW65496**

Date Sampled: **09/05/2012** Date Received: **09/07/2012** Date Reported: **2/6/2013**

| Nutrient In The Soil |  | Interpretation |     |     |      | 1st Crop Choice               |                 | 2nd Crop Choice               |             | 3rd Crop Choice                   |                 |              |              |       |
|----------------------|--|----------------|-----|-----|------|-------------------------------|-----------------|-------------------------------|-------------|-----------------------------------|-----------------|--------------|--------------|-------|
|                      |  | VLow           | Low | Med | High |                               |                 |                               |             |                                   |                 |              |              |       |
|                      |  |                |     |     |      | Corn-Silage                   |                 |                               |             |                                   |                 |              |              |       |
|                      |  |                |     |     |      | YIELD GOAL                    |                 | YIELD GOAL                    |             | YIELD GOAL                        |                 |              |              |       |
|                      |  |                |     |     |      | 20                            | Tons            | 0                             |             | 0                                 |                 |              |              |       |
|                      |  |                |     |     |      | SUGGESTED GUIDELINES          |                 | SUGGESTED GUIDELINES          |             | SUGGESTED GUIDELINES              |                 |              |              |       |
|                      |  |                |     |     |      | Band                          |                 | Band                          |             | Band                              |                 |              |              |       |
|                      |  |                |     |     |      | LB/ACRE                       | APPLICATION     | LB/ACRE                       | APPLICATION | LB/ACRE                           | APPLICATION     |              |              |       |
|                      |  |                |     |     |      | N                             | 111             | N                             |             | N                                 |                 |              |              |       |
|                      |  |                |     |     |      | P <sub>2</sub> O <sub>5</sub> | 17 Band *       | P <sub>2</sub> O <sub>5</sub> |             | P <sub>2</sub> O <sub>5</sub>     |                 |              |              |       |
|                      |  |                |     |     |      | K <sub>2</sub> O              | 10 Band (2x2) * | K <sub>2</sub> O              |             | K <sub>2</sub> O                  |                 |              |              |       |
|                      |  |                |     |     |      | Cl                            |                 | Cl                            |             | Cl                                |                 |              |              |       |
|                      |  |                |     |     |      | S                             | 0               | S                             |             | S                                 |                 |              |              |       |
|                      |  |                |     |     |      | B                             |                 | B                             |             | B                                 |                 |              |              |       |
|                      |  |                |     |     |      | Zn                            | 0               | Zn                            |             | Zn                                |                 |              |              |       |
|                      |  |                |     |     |      | Fe                            |                 | Fe                            |             | Fe                                |                 |              |              |       |
|                      |  |                |     |     |      | Mn                            |                 | Mn                            |             | Mn                                |                 |              |              |       |
|                      |  |                |     |     |      | Cu                            |                 | Cu                            |             | Cu                                |                 |              |              |       |
|                      |  |                |     |     |      | Mg                            | 0               | Mg                            |             | Mg                                |                 |              |              |       |
|                      |  |                |     |     |      | Lime                          |                 | Lime                          |             | Lime                              |                 |              |              |       |
|                      |  |                |     |     |      | Soil pH                       |                 | Cation Exchange Capacity      |             | % Base Saturation (Typical Range) |                 |              |              |       |
|                      |  |                |     |     |      | Buffer pH                     |                 |                               |             | % Ca                              | % Mg            | % K          | % Na         | % H   |
|                      |  |                |     |     |      | 0-6"                          | 8.0             | 50.3 meq                      |             | (65-75)<br>65.2                   | (15-20)<br>31.6 | (1-7)<br>2.5 | (0-5)<br>0.7 | (0-5) |

General Comments: Texture is not estimated on high pH soils.  
 Crop 1: \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 72 K2O = 166 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



Soil Analysis by Agvise Laboratories  
 Northwood: (701) 587-6010  
 Benson: (320) 843-4109

**SOIL TEST REPORT**

FIELD ID **2821**  
 SAMPLE ID  
 FIELD NAME **18**  
 COUNTY  
 TWP: **SW/SE15-8-5e**  
 SECTION QTR ACRES: **208**  
 PREY CROP **Grass/Alfalfa**

*Field 18+17+13*

SUBMITTED FOR:  
**Bronson Dairy**

SUBMITTED BY: **EL1911**  
**AGRA-GOLD CONSULTING LTD**  
**CLIFF LOEWEN**  
**BOX 156**  
**BLUMENORT, MB**      **ROA 0C0**

REF # **558915**    BOX **0**  
 LAB # **NW192124**

Date Sampled **11/09/2012**

Date Received **11/15/2012**

Date Reported **2/6/2013**

| Nutrient In The Soil |   | Interpretation |     |     |      | 1st Crop Choice               |                | 2nd Crop Choice               |             | 3rd Crop Choice               |                 |                                   |              |       |  |
|----------------------|---|----------------|-----|-----|------|-------------------------------|----------------|-------------------------------|-------------|-------------------------------|-----------------|-----------------------------------|--------------|-------|--|
|                      |   | VLow           | Low | Med | High |                               |                |                               |             |                               |                 |                                   |              |       |  |
|                      |   |                |     |     |      | Grass/Alfalfa                 |                |                               |             |                               |                 |                                   |              |       |  |
|                      |   |                |     |     |      | YIELD GOAL                    |                | YIELD GOAL                    |             | YIELD GOAL                    |                 |                                   |              |       |  |
|                      |   |                |     |     |      | 4                             | Tons           | 0                             |             | 0                             |                 |                                   |              |       |  |
|                      |   |                |     |     |      | SUGGESTED GUIDELINES          |                | SUGGESTED GUIDELINES          |             | SUGGESTED GUIDELINES          |                 |                                   |              |       |  |
|                      |   |                |     |     |      | Band                          |                | Band                          |             | Band                          |                 |                                   |              |       |  |
| Phosphorus           | Olsen 12 ppm                            |                |     |     |      | LB/ACRE                       | APPLICATION    | LB/ACRE                       | APPLICATION | LB/ACRE                       | APPLICATION     |                                   |              |       |  |
| Potassium            | 480 ppm                                 |                |     |     |      | N                             | 41             | N                             |             | N                             |                 |                                   |              |       |  |
| Chloride             |   |                |     |     |      | P <sub>2</sub> O <sub>5</sub> | 24 Broadcast   | P <sub>2</sub> O <sub>5</sub> |             | P <sub>2</sub> O <sub>5</sub> |                 |                                   |              |       |  |
| Sulfur               | 0-6" 20 lb/ac<br>6-24" 126 lb/ac        |                |     |     |      | K <sub>2</sub> O              | 0              | K <sub>2</sub> O              |             | K <sub>2</sub> O              |                 |                                   |              |       |  |
| Boron                |   |                |     |     |      | Cl                            |                | Cl                            |             | Cl                            |                 |                                   |              |       |  |
| Zinc                 | 1.44 ppm                                |                |     |     |      | S                             | 5 Band (Trial) | S                             |             | S                             |                 |                                   |              |       |  |
| Iron                 |   |                |     |     |      | B                             |                | B                             |             | B                             |                 |                                   |              |       |  |
| Manganese            |   |                |     |     |      | Zn                            | 0              | Zn                            |             | Zn                            |                 |                                   |              |       |  |
| Copper               |   |                |     |     |      | Fe                            |                | Fe                            |             | Fe                            |                 |                                   |              |       |  |
| Magnesium            | 1790 ppm                                |                |     |     |      | Mn                            |                | Mn                            |             | Mn                            |                 |                                   |              |       |  |
| Calcium              | 6894 ppm                                |                |     |     |      | Cu                            |                | Cu                            |             | Cu                            |                 |                                   |              |       |  |
| Sodium               | 57 ppm                                  |                |     |     |      | Mg                            | 0              | Mg                            |             | Mg                            |                 |                                   |              |       |  |
| Org.Matter           | 5.5 %                                   |                |     |     |      | Lime                          |                | Lime                          |             | Lime                          |                 |                                   |              |       |  |
| Carbonate(CCE)       |   |                |     |     |      | Soil pH                       |                | Buffer pH                     |             | Cation Exchange Capacity      |                 | % Base Saturation (Typical Range) |              |       |  |
|                      |   |                |     |     |      |                               |                |                               |             | % Ca                          | % Mg            | % K                               | % Na         | % H   |  |
| Sol. Salts           | 0-6" 0.64 mmho/cm<br>6-24" 0.55 mmho/cm |                |     |     |      | 0-6"                          | 7.9            | 50.9 meq                      |             | (65-75)<br>67.8               | (15-20)<br>29.3 | (1-7)<br>2.4                      | (0-5)<br>0.5 | (0-5) |  |

General Comments: Texture is not estimated on high pH soils.

Crop 1: \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 40 K2O = 192 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



Soil Analysis by **Agvise Laboratories**  
 Northwood: (701) 587-6010  
 Benson: (320) 843-4109

### SOIL TEST REPORT

FIELD ID **2822**  
 SAMPLE ID  
 FIELD NAME **19**  
 COUNTY  
 TWP **NW/NE10-8-5e**  
 SECTION QTR ACRES **181**  
 PREV. CROP **Corn-Silage**

*Field 19*

SUBMITTED FOR:  
**Bronson Dairy**

SUBMITTED BY: **EL1911**  
**AGRA-GOLD CONSULTING LTD**  
**CLIFF LOEWEN**  
**BOX 156**  
**BLUMENORT, MB**      **RDA 0C0**

REF # **422078**    BOX # **0**  
 LAB # **NW65495**

Date Sampled **09/05/2012**      Date Received **09/07/2012**      Date Reported **2/6/2013**

| Nutrient In The Soil  |   | Interpretation |     |     |      | 1st Crop Choice               |                 | 2nd Crop Choice               |             | 3rd Crop Choice                   |             |     |      |     |
|---|---|----------------|-----|-----|------|-------------------------------|-----------------|-------------------------------|-------------|-----------------------------------|-------------|-----|------|-----|
|   |   | VLow           | Low | Med | High |                               |                 |                               |             |                                   |             |     |      |     |
|   |   |                |     |     |      | Corn-Silage                   |                 |                               |             |                                   |             |     |      |     |
|   |   |                |     |     |      | YIELD GOAL                    |                 | YIELD GOAL                    |             | YIELD GOAL                        |             |     |      |     |
|   |   |                |     |     |      | 20                            | Tons            | 0                             |             | 0                                 |             |     |      |     |
|   |   |                |     |     |      | SUGGESTED GUIDELINES          |                 | SUGGESTED GUIDELINES          |             | SUGGESTED GUIDELINES              |             |     |      |     |
|   |   |                |     |     |      | Band                          |                 |                               |             |                                   |             |     |      |     |
| Phosphorus  | Olsen 19 ppm                            |                |     |     |      | LB/ACRE                       | APPLICATION     | LB/ACRE                       | APPLICATION | LB/ACRE                           | APPLICATION |     |      |     |
| Potassium   | 419 ppm                                 |                |     |     |      | N                             | 93              | N                             |             | N                                 |             |     |      |     |
| Chloride  |   |                |     |     |      | P <sub>2</sub> O <sub>5</sub> | 36 Band *       | P <sub>2</sub> O <sub>5</sub> |             | P <sub>2</sub> O <sub>5</sub>     |             |     |      |     |
| Sulfur  | 0-6" 18 lb/ac<br>6-24" 186 lb/ac        |                |     |     |      | K <sub>2</sub> O              | 10 Band (2x2) * | K <sub>2</sub> O              |             | K <sub>2</sub> O                  |             |     |      |     |
| Boron   |   |                |     |     |      | Cl                            |                 | Cl                            |             | Cl                                |             |     |      |     |
| Zinc  | 1.20 ppm                                |                |     |     |      | S                             | 0               | S                             |             | S                                 |             |     |      |     |
| Iron  |   |                |     |     |      | B                             |                 | B                             |             | B                                 |             |     |      |     |
| Manganese   |   |                |     |     |      | Zn                            | 0               | Zn                            |             | Zn                                |             |     |      |     |
| Copper  |   |                |     |     |      | Fe                            |                 | Fe                            |             | Fe                                |             |     |      |     |
| Magnesium   | 1931 ppm                                |                |     |     |      | Mn                            |                 | Mn                            |             | Mn                                |             |     |      |     |
| Calcium   | 7117 ppm                                |                |     |     |      | Cu                            |                 | Cu                            |             | Cu                                |             |     |      |     |
| Sodium  | 99 ppm                                  |                |     |     |      | Mg                            | 0               | Mg                            |             | Mg                                |             |     |      |     |
| Org.Matter  | 4.6 %                                   |                |     |     |      | Lime                          |                 | Lime                          |             | Lime                              |             |     |      |     |
| Carbonate(CCE)  |   |                |     |     |      | Soil pH                       |                 | Cation Exchange Capacity      |             | % Base Saturation (Typical Range) |             |     |      |     |
| Sol. Salts  | 0-6" 0.57 mmho/cm<br>6-24" 0.84 mmho/cm |                |     |     |      | Buffer pH                     |                 | 53.2 meq                      |             | % Ca                              | % Mg        | % K | % Na | % H |
| 0-6" 8.0      (65-75) 66.9    (15-20) 30.3    (1-7) 2.0    (0-5) 0.8    (0-5) |   |                |     |     |      |                               |                 |                               |             |                                   |             |     |      |     |

**General Comments:** Texture is not estimated on high pH soils.  
**Crop 1:** \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. **Crop Removal:** P2O5 = 72 K2O = 166 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



Soil Analysis by **Agvise Laboratories**  
 Northwood: (701) 587-6010  
 Benson: (320) 843-4109

**SOIL TEST REPORT**

FIELD ID **2824**  
 SAMPLE ID  
 FIELD NAME **21** *Field 15*  
 COUNTY  
 TWP **NW7-8-5e**  
 SECTION QTR ACRES **144**  
 PREV. CROP **Grass/Pasture**

SUBMITTED FOR:  
**Bronson Dairy**

SUBMITTED BY: **EL1911**  
**AGRA-GOLD CONSULTING LTD**  
**CLIFF LOEWEN**  
**BOX 156**  
**BLUMENORT, MB** ROA 0C0

REF \* **544609** BOX \* **0**  
 LAB \* **NW172482**

Date Sampled **10/26/2012** Date Received **10/31/2012** Date Reported **2/6/2013**

| Nutrient In The Soil |       | Interpretation |       |     |                               | 1st Crop Choice      |                               | 2nd Crop Choice                   |                               | 3rd Crop Choice      |              |       |
|----------------------|-------|----------------|-------|-----|-------------------------------|----------------------|-------------------------------|-----------------------------------|-------------------------------|----------------------|--------------|-------|
|                      |       | VLow           | Low   | Med | High                          | Grass/Pasture        |                               |                                   |                               |                      |              |       |
| Nitrate              | 0-6"  | 9 lb/ac        |       |     |                               | YIELD GOAL           |                               | YIELD GOAL                        |                               | YIELD GOAL           |              |       |
|                      | 6-24" | 6 lb/ac        | ***   |     |                               | 4                    | Tons                          | 0                                 |                               | 0                    |              |       |
|                      | 0-24" | 15 lb/ac       |       |     |                               | SUGGESTED GUIDELINES |                               | SUGGESTED GUIDELINES              |                               | SUGGESTED GUIDELINES |              |       |
|                      |       |                |       |     |                               | Band                 |                               | Band                              |                               | Band                 |              |       |
| Phosphorus           | Olsen | 44 ppm         | ***** |     |                               | LB/ACRE              | APPLICATION                   | LB/ACRE                           | APPLICATION                   | LB/ACRE              | APPLICATION  |       |
| Potassium            |       | 416 ppm        | ***** |     | N                             | 105                  | N                             |                                   | N                             |                      |              |       |
| Chloride             |       |                |       |     | P <sub>2</sub> O <sub>5</sub> | 0                    | P <sub>2</sub> O <sub>5</sub> |                                   | P <sub>2</sub> O <sub>5</sub> |                      |              |       |
| Sulfur               | 0-6"  | 22 lb/ac       | ***** |     | K <sub>2</sub> O              | 0                    | K <sub>2</sub> O              |                                   | K <sub>2</sub> O              |                      |              |       |
| Boron                | 6-24" | 114 lb/ac      | ***** |     | Cl                            |                      | Cl                            |                                   | Cl                            |                      |              |       |
| Zinc                 |       | 3.52 ppm       | ***** |     | S                             | 0                    | S                             |                                   | S                             |                      |              |       |
| Iron                 |       |                |       |     | B                             |                      | B                             |                                   | B                             |                      |              |       |
| Manganese            |       |                |       |     | Zn                            | 0                    | Zn                            |                                   | Zn                            |                      |              |       |
| Copper               |       |                |       |     | Fe                            |                      | Fe                            |                                   | Fe                            |                      |              |       |
| Magnesium            |       | 1722 ppm       | ***** |     | Mn                            |                      | Mn                            |                                   | Mn                            |                      |              |       |
| Calcium              |       | 5888 ppm       | ***** |     | Cu                            |                      | Cu                            |                                   | Cu                            |                      |              |       |
| Sodium               |       | 61 ppm         | ***** |     | Mg                            | 0                    | Mg                            |                                   | Mg                            |                      |              |       |
| Org.Matter           |       | 5.7 %          | ***** |     | Lime                          |                      | Lime                          |                                   | Lime                          |                      |              |       |
| Carbonate(CCE)       |       |                |       |     | Soil pH                       | Buffer pH            | Cation Exchange Capacity      | % Base Saturation (Typical Range) |                               |                      |              |       |
| Sol. Salts           | 0-6"  | 0.6 mmho/cm    | ***** |     |                               |                      |                               | % Ca                              | % Mg                          | % K                  | % Na         | % H   |
|                      | 6-24" | 0.64 mmho/cm   | ***** |     | 0-6"                          | 7.9                  | 45.1 meq                      | (65-75)<br>65.2                   | (15-20)<br>31.8               | (1-7)<br>2.4         | (0-5)<br>0.6 | (0-5) |

General Comments: Texture is not estimated on high pH soils.  
 Crop 1: \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 48  
 K2O = 180 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



Soil Analysis by **Agvise Laboratories**  
 Northwood: (701) 587-6010  
 Benson: (320) 843-4109

### SOIL TEST REPORT

FIELD ID **2825**  
 SAMPLE ID  
 FIELD NAME **22** *Field 16*  
 COUNTY  
 TWP **SE15-8-5e**  
 SECTION QTR ACRES **60**  
 PREV. CROP **Corn-Silage**

SUBMITTED FOR:  
**Bronson Dairy**

SUBMITTED BY: **EL1911**  
**AGRA-GOLD CONSULTING LTD**  
**CLIFF LOEWEN**  
**BOX 156**  
**BLUMENORT, MB** ROA 0C0

REF # **427116** BOX : **0**  
 LAB # **NW71860**

Date Sampled **09/11/2012** Date Received **09/12/2012** Date Reported **2/6/2013**

| Nutrient In The Soil |  | Interpretation |     |     |      | 1st Crop Choice                  |                 | 2nd Crop Choice               |             | 3rd Crop Choice                   |                      |              |              |       |
|----------------------|--|----------------|-----|-----|------|----------------------------------|-----------------|-------------------------------|-------------|-----------------------------------|----------------------|--------------|--------------|-------|
|                      |  | VLow           | Low | Med | High |                                  |                 |                               |             |                                   |                      |              |              |       |
|                      |  |                |     |     |      | Wheat-Spring                     |                 |                               |             |                                   |                      |              |              |       |
|                      |  |                |     |     |      | YIELD GOAL                       |                 | YIELD GOAL                    |             |                                   | YIELD GOAL           |              |              |       |
|                      |  |                |     |     |      | 60 BU                            |                 | 0                             |             |                                   | 0                    |              |              |       |
|                      |  |                |     |     |      | SUGGESTED GUIDELINES             |                 | SUGGESTED GUIDELINES          |             |                                   | SUGGESTED GUIDELINES |              |              |       |
|                      |  |                |     |     |      | Band                             |                 |                               |             |                                   |                      |              |              |       |
|                      |  |                |     |     |      | LB/ACRE                          | APPLICATION     | LB/ACRE                       | APPLICATION | LB/ACRE                           | APPLICATION          |              |              |       |
|                      |  |                |     |     |      | N 91                             |                 | N                             |             | N                                 |                      |              |              |       |
|                      |  |                |     |     |      | P <sub>2</sub> O <sub>5</sub> 43 | Band *          | P <sub>2</sub> O <sub>5</sub> |             | P <sub>2</sub> O <sub>5</sub>     |                      |              |              |       |
|                      |  |                |     |     |      | K <sub>2</sub> O 10              | Band (Starter)* | K <sub>2</sub> O              |             | K <sub>2</sub> O                  |                      |              |              |       |
|                      |  |                |     |     |      | Cl                               |                 | Cl                            |             | Cl                                |                      |              |              |       |
|                      |  |                |     |     |      | S 7                              | Band (Triat)    | S                             |             | S                                 |                      |              |              |       |
|                      |  |                |     |     |      | B                                |                 | B                             |             | B                                 |                      |              |              |       |
|                      |  |                |     |     |      | Zn 2                             | Band (Triat)    | Zn                            |             | Zn                                |                      |              |              |       |
|                      |  |                |     |     |      | Fe                               |                 | Fe                            |             | Fe                                |                      |              |              |       |
|                      |  |                |     |     |      | Mn                               |                 | Mn                            |             | Mn                                |                      |              |              |       |
|                      |  |                |     |     |      | Cu                               |                 | Cu                            |             | Cu                                |                      |              |              |       |
|                      |  |                |     |     |      | Mg 0                             |                 | Mg                            |             | Mg                                |                      |              |              |       |
|                      |  |                |     |     |      | Lime                             |                 | Lime                          |             | Lime                              |                      |              |              |       |
|                      |  |                |     |     |      | Soil pH                          | Buffer pH       | Cation Exchange Capacity      |             | % Base Saturation (Typical Range) |                      |              |              |       |
|                      |  |                |     |     |      |                                  |                 |                               |             | % Ca                              | % Mg                 | % K          | % Na         | % H   |
|                      |  |                |     |     |      | 0-6" 7.7                         |                 | 45.3 meq                      |             | (65-75)<br>66.8                   | (15-20)<br>30.8      | (1-7)<br>2.1 | (0-5)<br>0.3 | (0-5) |

General Comments: Texture is not estimated on high pH soils.  
 Crop 1: \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 38 K2O = 23 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Operation Name:

| STEP 1: Livestock Information |       | Species                                     | Type   | Manure Type     | Livestock Places | Animal Units | Production Cycle (Days) | Rotation | Output per head |        | Production-N |       | Production P <sub>2</sub> O <sub>5</sub> |    |
|-------------------------------|-------|---|--------|-----------------|------------------|--------------|-------------------------|----------|-----------------|--------|--------------|-------|--|----|
|                               |       |   |        |                 |                  |              |                         |          | kg N            | kg P   | kg           | lb    | kg                                       | lb |
| 1                             | Dairy | Dairy Cows (including associated livestock) | Liquid | 1080            | 2160             | 365          | 1                       | 154.5    | 75              | 166860 | 367092       | 81000 | 178200                                   |    |
| 2                             |       |   |        |                 |                  |              |                         |          |                 |        |              |       |  |    |
| 3                             |       |   |        |                 |                  |              |                         |          |                 |        |              |       |  |    |
| 4                             |       |   |        |                 |                  |              |                         |          |                 |        |              |       |  |    |
| 5                             |       |   |        |                 |                  |              |                         |          |                 |        |              |       |  |    |
|                               |       |   |        | <b>Total AU</b> | <b>2160</b>      |              |                         |          |                 |        |              |       |  |    |

| STEP 2: Crop Rotation Information |              |                               | Removal (lb/ac)               |                                 |
|-----------------------------------|--------------|-------------------------------|-------------------------------|---------------------------------|
|                                   | Nitrogen (N) | P <sub>2</sub> O <sub>5</sub> | P <sub>2</sub> O <sub>5</sub> | 2XP <sub>2</sub> O <sub>5</sub> |
| 1. Detailed Rotation (Farm Data)  | 154          | 44                            | 86                            |                                 |

| STEP 3: Nitrogen Volatilization |      |           |
|---------------------------------|------|-----------|
| 1. Manure                       | Type | Value (%) |
| Liquid                          | Open | 20        |

| STEP 4: Phytase Added    |            |           |
|--------------------------|------------|-----------|
| 2. Method of Application | Conditions | Value (%) |
| Injected                 | No Data    | 0         |

| STEP 4: Phytase Added                       |    |
|---|----|
| 1. Was phytase used as an additive in feed? | No |
|   | No |

| Base Total N:                                     |  | 166860 | 367092 | 81000 | 178200 |
|---|--|--------|--------|-------|--------|
| Post Manure Application N:                        |  | 133488 | 293674 | --    | --     |
| LAND BASE REQUIRED                                |  | Acres  |        | Acres |        |
| Nitrogen (N) based                                |  | 1906   | 1906   | 1906  |        |
| Phosphorus (P <sub>2</sub> O <sub>5</sub> ) based |  | 2018   | 2018   | 4035  |        |

1. Nutrient values excreted by livestock is adapted from Quebec (Le Centre de reference en agriculture et agroalimentaire du Quebec - CREAQ)
2. Nutrient excretion for sows is based upon unpublished data for Manitoba
3. Nutrient values for turkeys based upon data from "Farm Practices Guidelines for Poultry Producers in Manitoba, 2000"

Operation:

| Crop             | Example<br>Manitoba<br>Target<br>Yields | Unit    | Historical<br>Yield | Nutrient Removal (lb/ac)      |                                   |                 |             | Uptake (lb/ac)                |                                   |                 |              | Total Removal                 |                                   |                 |       |
|------------------|---|---------|---------------------|-------------------------------|-----------------------------------|-----------------|-------------|-------------------------------|-----------------------------------|-----------------|--------------|-------------------------------|-----------------------------------|-----------------|-------|
|                  |   |         |                     | P <sub>2</sub> O <sub>5</sub> | 2(P <sub>2</sub> O <sub>5</sub> ) | Nitrogen<br>(N) | Acres       | P <sub>2</sub> O <sub>5</sub> | 2(P <sub>2</sub> O <sub>5</sub> ) | Nitrogen<br>(N) | Acres        | P <sub>2</sub> O <sub>5</sub> | 2(P <sub>2</sub> O <sub>5</sub> ) | Nitrogen<br>(N) | Acres |
| Alfalfa          | 5                                       | tons/ac | 3.31                | 46                            | 91                                | 192             | 30          | 26.11                         | 52.22                             | 109.74          | 1157         | 17.15                         |                                   |                 |       |
| Barley Grain     | 80                                      | bu/ac   |                     |                               |                                   |                 |             |                               |                                   |                 |              |                               |                                   |                 |       |
| Barley Silage    | 4.5                                     | tons/ac |                     |                               |                                   |                 |             |                               |                                   |                 |              |                               |                                   |                 |       |
| Canola           | 35                                      | bu/ac   |                     | 40                            | 80                                |                 | 110         |                               |                                   |                 |              |                               |                                   |                 |       |
| Corn Grain       | 100                                     | bu/ac   |                     | 40                            | 80                                |                 | 150         |                               |                                   |                 |              |                               |                                   |                 |       |
| Corn Silage      | 5                                       | tons/ac | 3.318               | 42                            | 84                                | 104             | 0           | 18.05                         | 36.10                             | 44.34           | 867          | 0.00                          |                                   |                 |       |
| Dry edible beans | 18                                      | cwt/ac  |                     | 25                            | 50                                |                 |             |                               |                                   |                 |              |                               |                                   |                 |       |
| Fababeans        | 34                                      | cwt/ac  |                     |                               |                                   |                 |             |                               |                                   |                 |              |                               |                                   |                 |       |
| Flax             | 24                                      | bu/ac   |                     |                               |                                   |                 |             |                               |                                   |                 |              |                               |                                   |                 |       |
| Grass hay        | 3                                       | tons/ac |                     | 30                            | 60                                |                 | 100         |                               |                                   |                 |              |                               |                                   |                 |       |
| Lentils          | 18                                      | cwt/ac  |                     |                               |                                   |                 |             |                               |                                   |                 |              |                               |                                   |                 |       |
| Oats             | 100                                     | bu/ac   |                     |                               |                                   |                 |             |                               |                                   |                 |              |                               |                                   |                 |       |
| Peas             | 50                                      | bu/ac   |                     |                               |                                   |                 |             |                               |                                   |                 |              |                               |                                   |                 |       |
| Potatoes         | 400                                     | cwt/ac  |                     |                               |                                   |                 |             |                               |                                   |                 |              |                               |                                   |                 |       |
| Rye              | 55                                      | bu/ac   |                     |                               |                                   |                 |             |                               |                                   |                 |              |                               |                                   |                 |       |
| Soybeans         | 35                                      | bu/ac   |                     | 25                            | 50                                |                 | 30          |                               |                                   |                 |              |                               |                                   |                 |       |
| Sunflower        | 22                                      | cwt/ac  |                     |                               |                                   |                 |             |                               |                                   |                 |              |                               |                                   |                 |       |
| Wheat - Spring   | 40                                      | bu/ac   |                     |                               |                                   |                 |             |                               |                                   |                 |              |                               |                                   |                 |       |
| Wheat - Winter   | 75                                      | bu/ac   |                     |                               |                                   |                 |             |                               |                                   |                 |              |                               |                                   |                 |       |
| <b>Total</b>     |   |         |                     |                               |                                   |                 |             |                               |                                   |                 |              |                               |                                   |                 |       |
|                  |   |         |                     |                               |                                   |                 | <b>2024</b> | <b>44.16</b>                  | <b>88.32</b>                      | <b>154.09</b>   | <b>17.15</b> |                               |                                   |                 |       |





Web address: [http://www.mmpp.com/mmpp.nsf/mmpp\\_browser\\_fertilizer.html](http://www.mmpp.com/mmpp.nsf/mmpp_browser_fertilizer.html)

### MMPP Fertilizer Data Browser

[\(Fertilizer Query Help\)](#)

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#### Search Summary

Your selected search:

**Region(s)** Selected: HANOVER, STE. ANNE, TACHE

**Crop(s)** Selected: ALFALFA

**Soil Zone(s)** Selected: SOIL TYPE E

**Period** Selected: 2003 to 2012

This search returned 16 records from the MASC database, summarized below:

Total Acres: **1,716 acres**  
 Yield per Acre: **3.310 Tons / acre** (3.004 tonnes / acre)

**Fertilizer Applied per Acre (actual product):**

Nitrogen: **18.5 lbs / acre** (0.008 tonnes / acre)  
 Phosphorus: **36.4 lbs / acre** (0.017 tonnes / acre)  
 Potassium: **15.6 lbs / acre** (0.007 tonnes / acre)  
 Sulfur: **2.1 lbs / acre** (0.001 tonnes / acre)

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Web address: [http://www.mmpp.com/mmpp.nsf/mmpp\\_browser\\_fertilizer.html](http://www.mmpp.com/mmpp.nsf/mmpp_browser_fertilizer.html)

### MMPP Fertilizer Data Browser

[\(Fertilizer Query Help\)](#)

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#### Search Summary

Your selected search:

- Region(s)** Selected: HANOVER, STE. ANNE, TACHE
- Crop(s)** Selected: SILAGE CORN
- Soil Zone(s)** Selected: SOIL TYPE E
- Period** Selected: 2003 to 2012

This search returned 18 records from the MASC database, summarized below:

Total Acres: **1,749 acres**  
 Yield per Acre: **9.481 Tons / acre** (8.603 tonnes / acre)  
*X .35 = 3.318 Dry*

**Fertilizer Applied per Acre (actual product):**

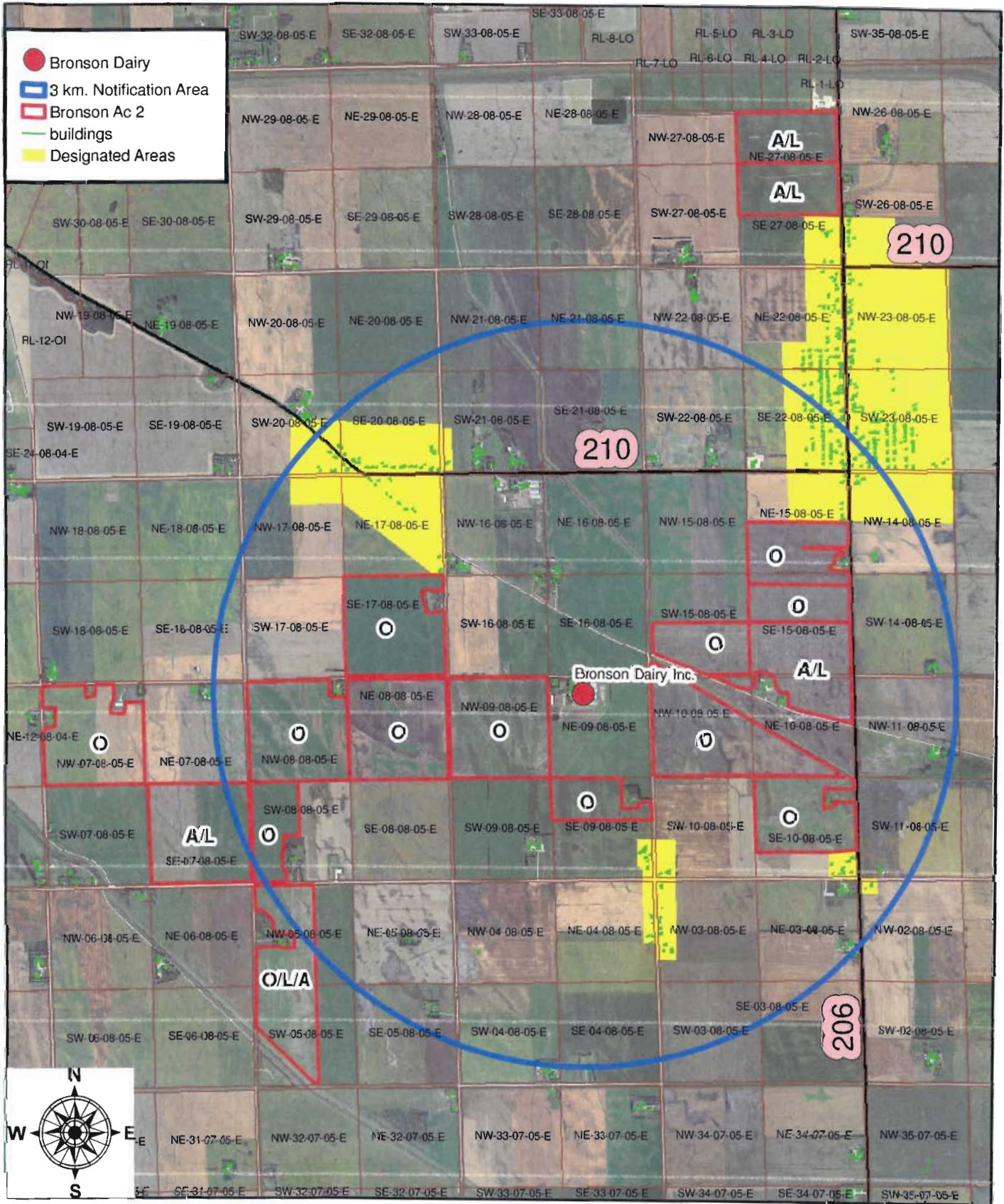
Nitrogen: **89.7 lbs / acre** (0.041 tonnes / acre)  
 Phosphorus: **24.0 lbs / acre** (0.011 tonnes / acre)  
 Potassium: **13.6 lbs / acre** (0.006 tonnes / acre)  
 Sulfur: **0.1 lbs / acre** (0.000 tonnes / acre)

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# Bronson Dairy Land Use and Spread Acre Map



0 0.5 1 2 Miles

June 4, 2013



An Office Consolidation of:  
 Development Plan Map One  
**RM of Taché**

Prepared By:  
**Mackinac**  
 Department of Local Government  
 Community & Regional Planning Branch  
 Sturtevant Hwy. September 2011

# Bronson Dairy Truck Routes

