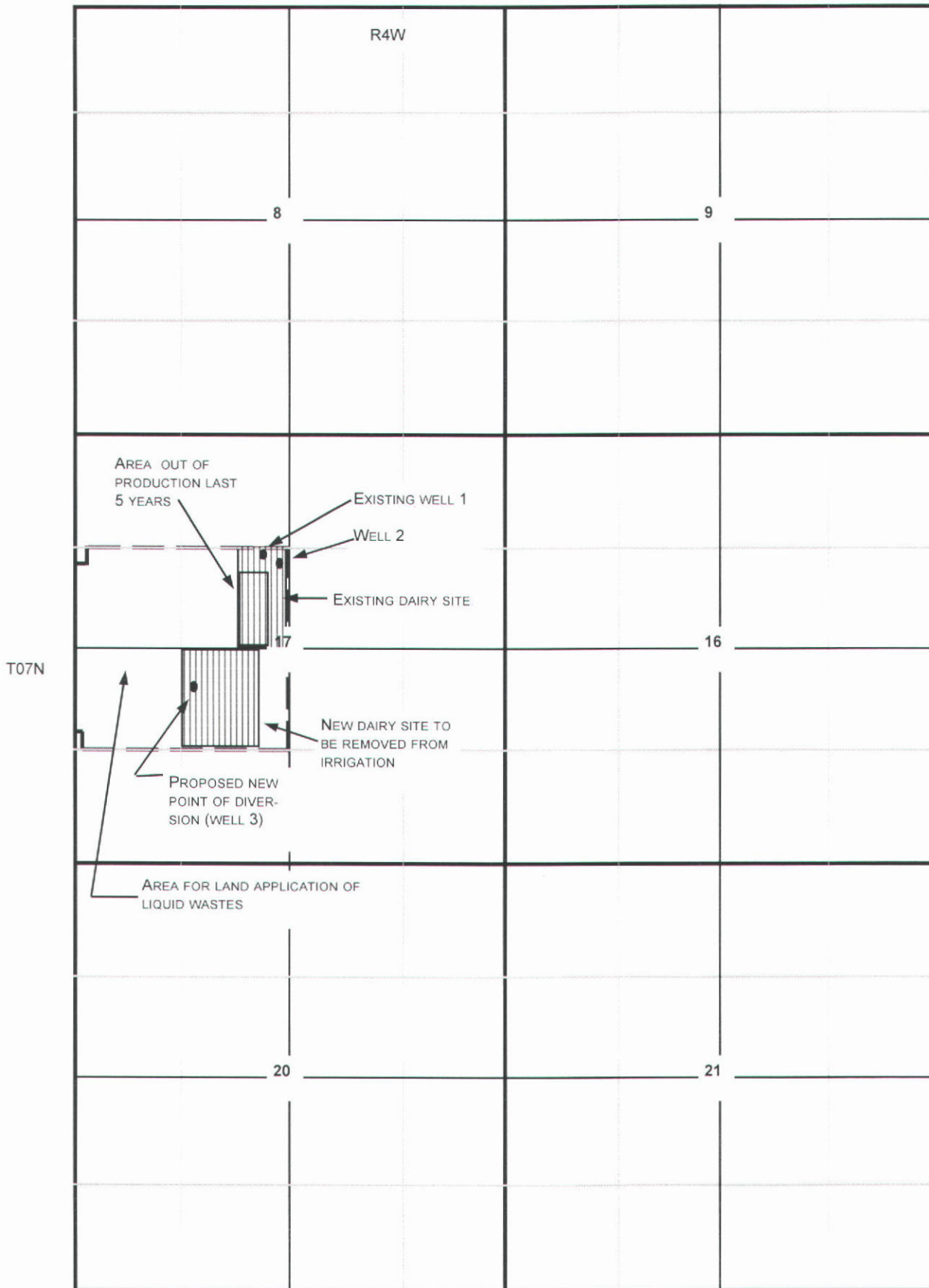
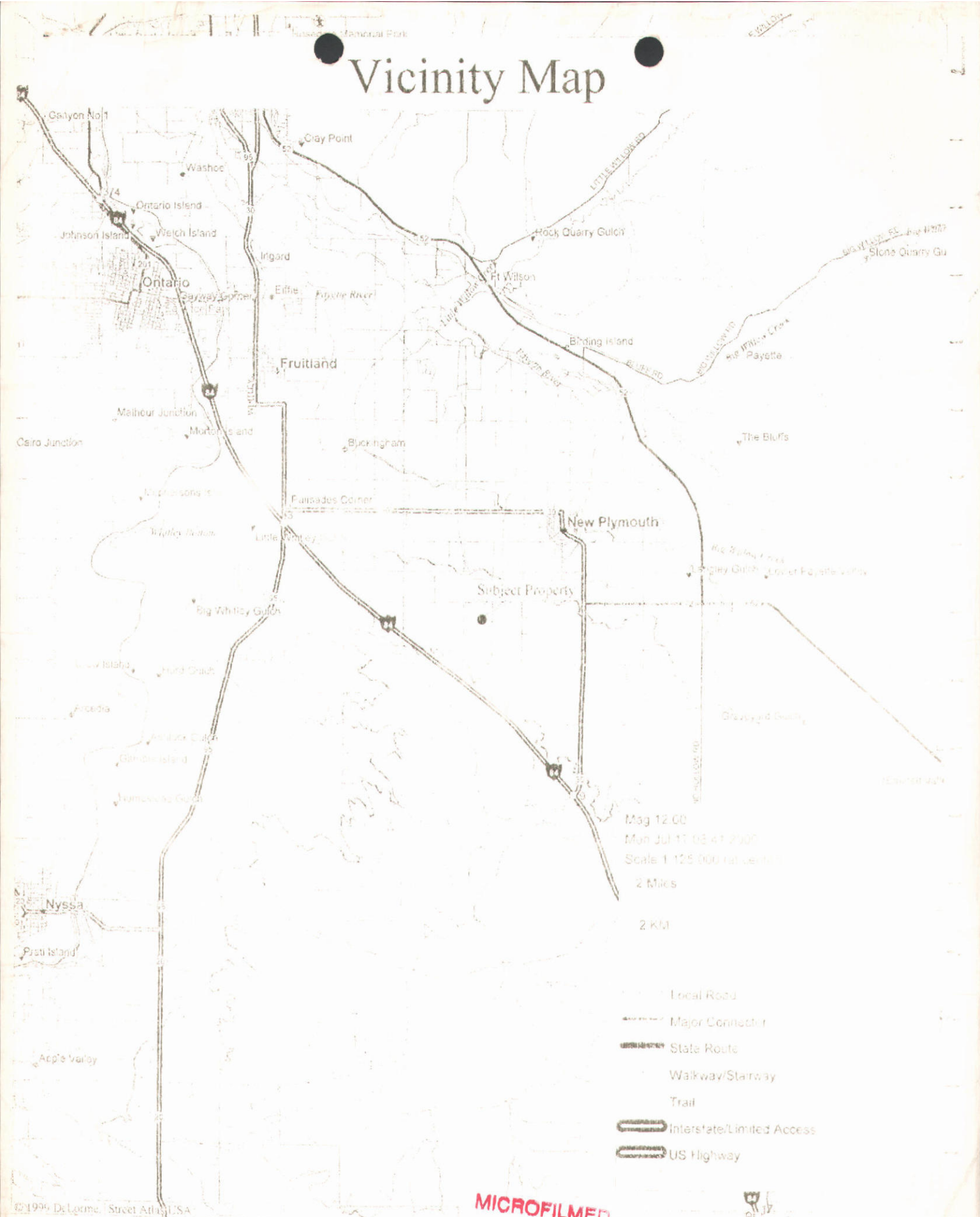




FRANK TEUNISSEN	SITE MAP	MICROFILMED
T 07N, R 04W , SEC 17		SCALE 3" = 1 MILE
		FEB 04 2007 PREPARED BY: DARWIN VANDER STELT

Vicinity Map



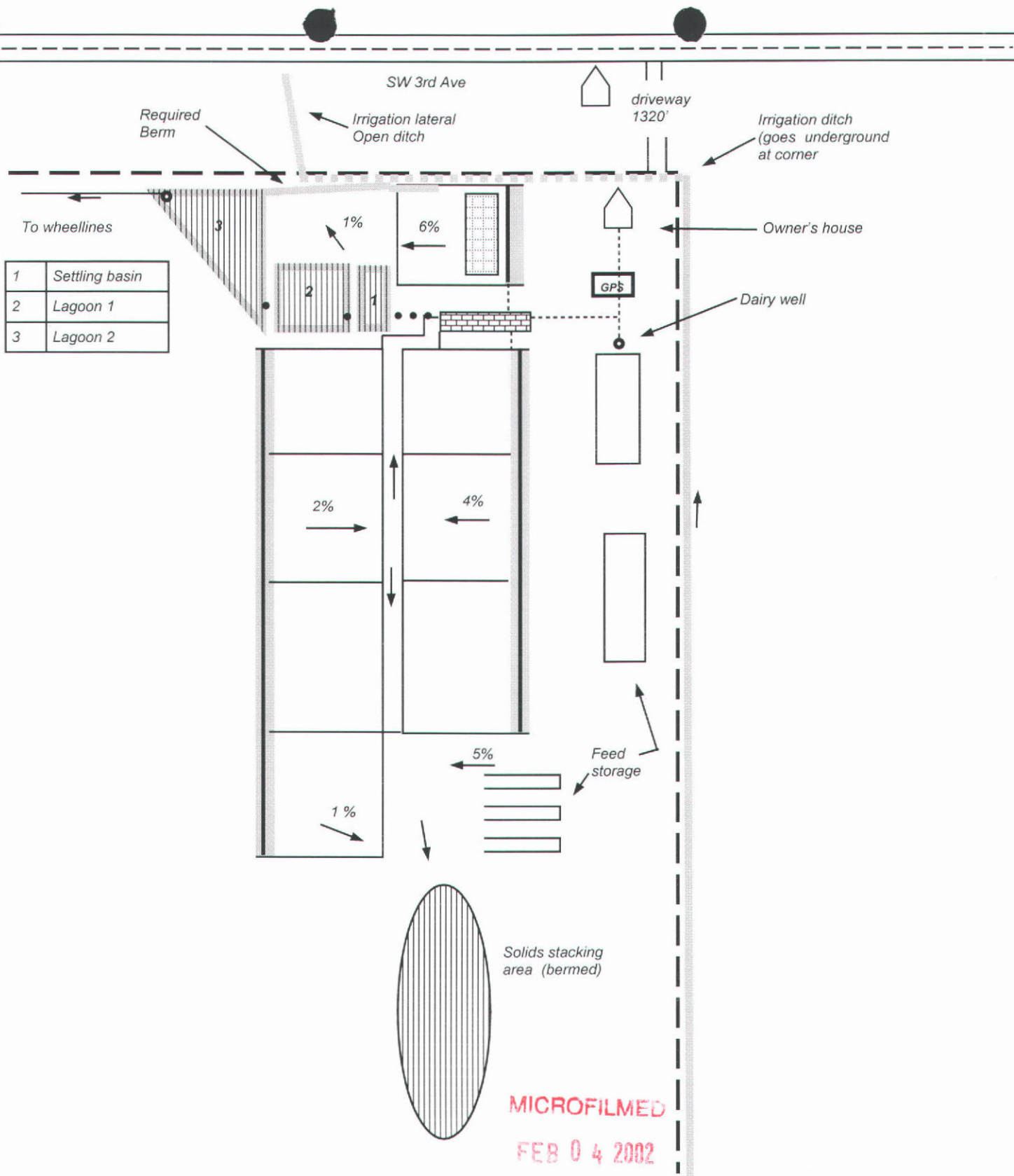
MICROFILMED

FEB 04 2002

2



FEB 04 2002



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Site Plan		
Frank Teunissen	Scale: 1" = 263'	
3749 SW 3rd		Prepared by
New Plymouth, ID 83655		Darwin Vander Stelt



together hold a total of 551,600 cu. ft., which is more than adequate for 180 days storage. The calculations for the required 180 day storage for liquid wastes is found in Appendix C.

Table 1 shows the total quantity of nutrients produced on the facility.

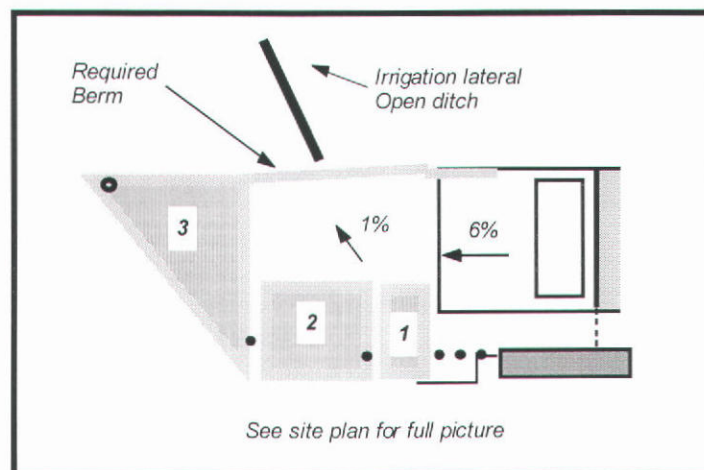
Table 1. Nutrients Produced					
Description	Volume cu.ft	N lbs/yr	P lbs/yr	K lbs/yr	Ton@40#/cf) Gallons
Lagoon	716,275	2,980	1,288	4,783	5,372,061
Solid Waste	643,841	63,373	28,082	118,109	12,877
Total Nutrients Produced	1,360,115	66,353	29,370	122,892	
Deduct: Nutrients exported	555,765	54,704	24,240	101,952	
Total Nutrients for Land Application		11,649	5,129	20,940	

See Appendix A

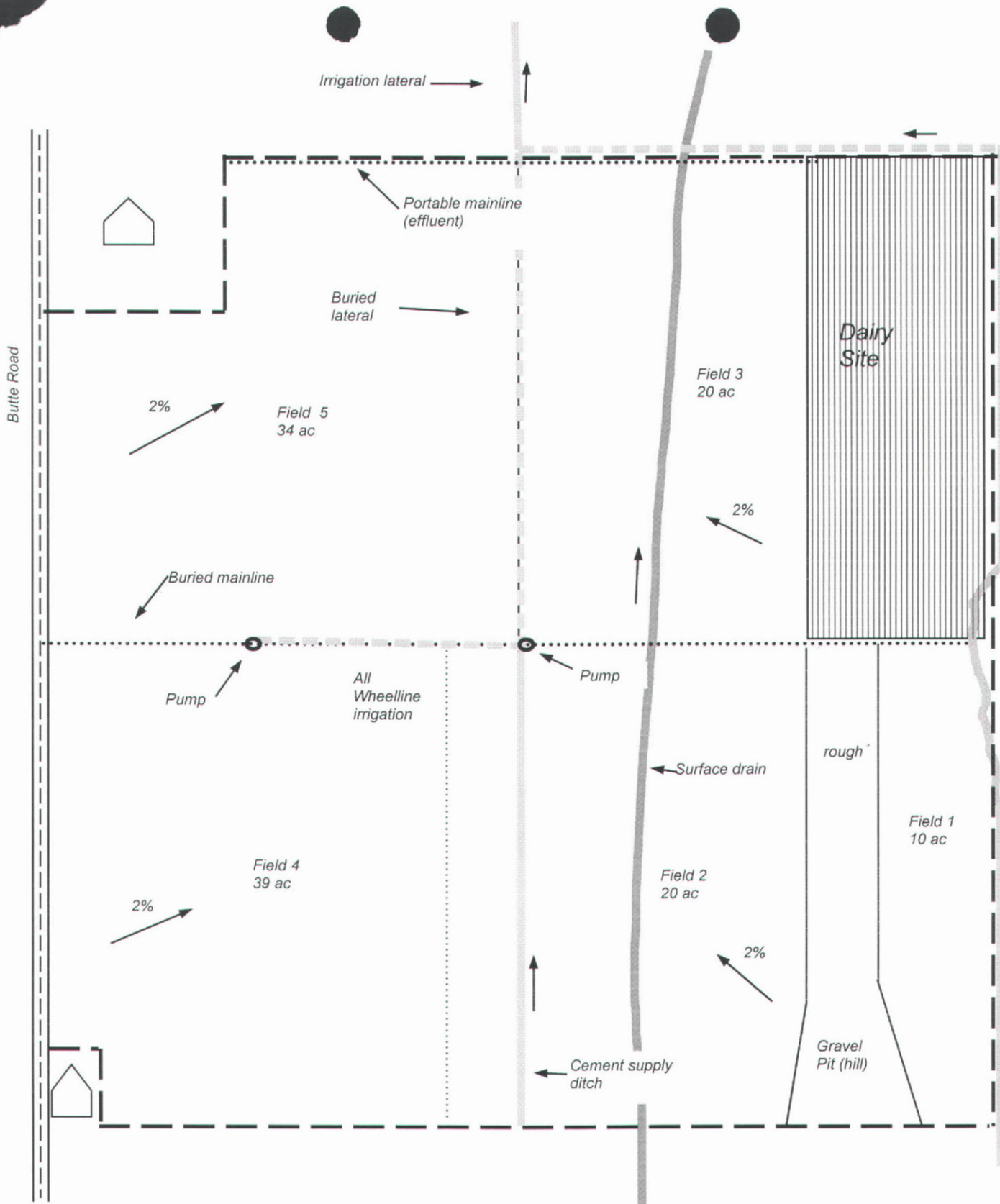
Percentage of N, P, and K to be exported:	82%
Percentage of solid waste to be exported:	86%

Raw data used to calculate the information illustrated in Table 1 is found in Appendix A. The actual tonnage of material to be applied or exported is dependent upon the degree of decomposition of the solid material, moisture levels and other factors. The producer is required to keep records, both of tonnage applied, and tonnage exported, to verify that an appropriate percentage of solid manure is exported.

The drain ditch running north of the corrals could provide a means for transporting run-off to the Payette River and should be bermed to prevent this possibility. The berm should be connected to the embankment of the lagoon, and should run as far east along the edge of the corral as is necessary to prevent any accidental run-off.



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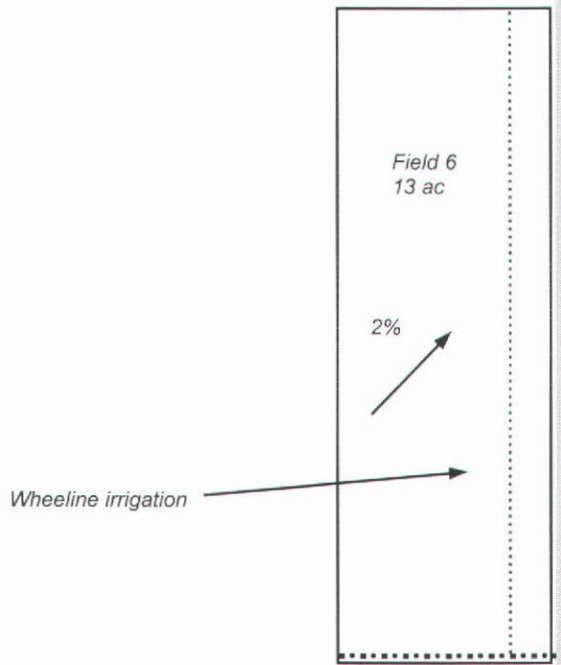
Field Application Map		
Frank Teunissen	Scale: 1" = 385	
3749 SW 3rd		Prepared by
New Plymouth, ID 83655		Darwin Vander Stelt

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Rented Field (6)

Adjoins field 4



Field Application Map		
Frank Teunissen	Scale: 1" = 385'	
3749 SW 3rd		Prepared by
New Plymouth, ID 83655		Darwin Vander Stelt



Field No: 4

No. Acres 39.0

Available water capacity (AWC):

Soil Type & code nos:

Power-Elijah silt loam

Crop: Alfalfa Hay

Rooting Depth(in): 48

depth	inches	AWC (in/in)	in/in
0-12	12	0.21	0.053
13-36	24	0.21	0.105
37-48	12	0.12	0.030
			0.000
Total	48	AWC	0.19

Max. ET for crop (Allen and Brockway, Payette):

mm/day 7.13 in/day 0.28

Source: Soil Survey, Payette County Area,

Management Allowable Depletion (MAD):

55%

Irrigation Method

Handline

Irrigation efficiency

70%

Theoretical frequency to irrigate:

available water (in) 4.95

days until depleted 17.6

Days between irrigation 7

Water to apply each irrigation (in): 2.81

Application Rate in inches /hr 0.23

Flow calculations

Miner's
inches

System flow (Gal/Min) 386.0 43

Row length (ft) 1320

Distance between sets (ft) 60

Gal water to apply(field) 2,980,494

Flow rate per sprinkler 5.85 6.00

Set time (hrs) 12

No. sprinkler heads/line 33

No. sets/line 11

No. laterals this field 2

Permeability			Maximum
depth	inches	Perm* (in/hr)	Rate**
0-12	12	2	0.42
13-36	24	0.6	0.13
37-48	12	3	0.36
			0.00
Total	48	1.55	

Source: Soil Survey, Payette County Area,

*max. permeability in inches of travel per hour

** uptake in inches of water/hr

Permeability Class

Moderately slow

Recommendations:

(Hottest week in July, Alfalfa)

Set Time: 12 hrs

Frequency = 7 days

6 gpm nozzles, 2 lines, 11
sets /line

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FEB 04 2002

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

REQUEST FOR EXTENSION OF TIME

TO PROVIDE ADDITIONAL TIME IN WHICH TO SUBMIT PROOF OF
BENEFICIAL USE FOR A WATER RIGHT PERMIT

RECEIVED

SEP 18 2002

Department of Water Resources

The Idaho Department of Water Resources will consider this form as a request that the permit holder(s) be granted an additional period of time under the provisions of Section 42-204, Idaho Code in which to complete development of a water right.

Permit No. 105-22349

Name(s) of Permit Holder: FRANK TEUNISSEN

Address: 3749 S.W. 3RD AVENUE City NEW PLYMOUTH State ID Zip 83655

Telephone No. 278-3205 Date Proof is Due: OCTOBER 1, 2002

Describe what work has been completed toward the development of this water right:
(This must be filled out! If no work has been completed, show "none".)

A DRILLING PERMIT HAS BEEN FILED AND WELL DRILLING
HAS COMMENCED. HOWEVER, AT THE REQUEST OF THE DRILLING
COMPANY, THEY HAVE ASKED FOR US TO FILE FOR AN EXTENSION
IN THE EVENT THEY ARE UNABLE TO BE COMPLETED BY
OCTOBER 1, 2002. Costing \$ _____

The permit holder(s) has been unable to complete the remainder of the work for the following reasons:

* WE HAVE RECENTLY JUST COMPLETED LAND LEVELING AT THE
SIGHT OF THE WELL. THIS WAS THE REASONING FOR THE
LATE START. WE ANTICIPATE USING THE FULL WATER RIGHT IN
THE SPRING OR SUMMER OF 2003, ONCE THE DAIRY PARLOR IS COMPLETE.

Permit holder(s) request an extension to OCTOBER 1, 20 06

Frank Teunissen
(Signature)*

*If other than permit holder, Power of Attorney must be supplied.

ACTION OF THE DEPARTMENT OF WATER RESOURCES

IT IS HEREBY ORDERED that the above request for extension of time be

APPROVED and the time within which to submit proof of beneficial use
is extended to October 1, 2006.

Signed this 24th day of September, 2002

L. Glen Saxton
L. GLEN SAXTON, Chief
Water Allocation Bureau

State of Idaho
Department of Water Resources
Permit to Appropriate Water

NO. 65-22349

Priority: 03/13/2001

Maximum Diversion Rate: 0.50 CFS

This is to certify, that FRANK TEUNISSEN
3749 SW 3RD AVE
NEW PLYMOUTH ID 83655

has applied for a permit to appropriate water from:

Source: GROUND WATER

and a permit is APPROVED for development of water as follows:

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>RATE OF DIVERSION</u>
COMMERCIAL	01/01 to 12/31	0.50 CFS
STOCKWATER	01/01 to 12/31	0.50 CFS
DOMESTIC	01/01 to 12/31	0.04 CFS

LOCATION OF POINT(S) OF DIVERSION:

GROUND WATER	SE $\frac{1}{4}$ NW $\frac{1}{4}$	Sec. 17, Twp 07N, Rge 04W, B.M.	PAYETTE County
GROUND WATER	SE $\frac{1}{4}$ NW $\frac{1}{4}$	Sec. 17, Twp 07N, Rge 04W, B.M.	PAYETTE County
GROUND WATER	NE $\frac{1}{4}$ SW $\frac{1}{4}$	Sec. 17, Twp 07N, Rge 04W, B.M.	PAYETTE County

PLACE OF USE: STOCKWATER

Twp Rge Sec	NE				NW				SW				SE				
	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	Totals
07N 04W 17								X	X								

PLACE OF USE: COMMERCIAL

Twp Rge Sec	NE				NW				SW				SE				
	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	Totals
07N 04W 17							X	X	X	X							

PLACE OF USE: DOMESTIC

Twp Rge Sec	NE				NW				SW				SE				
	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	Totals
07N 04W 17								X									

CONDITIONS OF APPROVAL

- 1 Proof of application of water to beneficial use shall be submitted on or before **October 1, 2002**.
- 2 Subject to all prior water rights
- 3 Right holder shall comply with the drilling permit requirements of Section 42-235, Idaho Code
- 4 After specific notification by the Department, the right holder shall install a suitable measuring device or shall enter into an agreement with the Department to determine the amount of water diverted from power records and shall annually report the information to the Department.

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FEB 04 2002

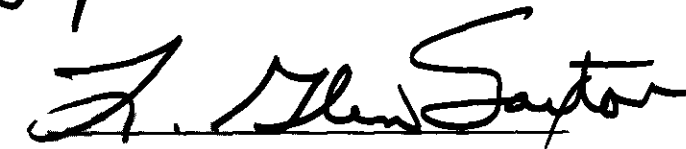
State of Idaho
Department of Water Resources
Permit to Appropriate Water

NO. 65-22349

CONDITIONS OF APPROVAL

5. The Director retains jurisdiction to require the right holder to provide purchased or leased natural flow or stored water to offset depletion of Lower Snake River flows if needed for salmon migration purposes. The amount of water required to be released into the Snake River or a tributary, if needed for this purpose, will be determined by the Director based upon the reduction in flow caused by the use of water pursuant to this permit.
6. The place of commercial use authorized by this approval includes land upon which wastewater may be applied for irrigation purposes to satisfy water quality requirements. Water diverted under this approval shall not be used for irrigation unless the water is first used in the dairy as authorized by this water right
7. Commercial use is for a dairy.
8. Stockwater use is for 1300 dairy cattle and 900 head young stock.
9. Domestic use is for 1 home.

This permit is issued pursuant to the provisions of Section 42-204, Idaho Code. Witness the signature of the Director, affixed at Boise, this 28th day of September, 2001.


for KARL J DREHER, Director

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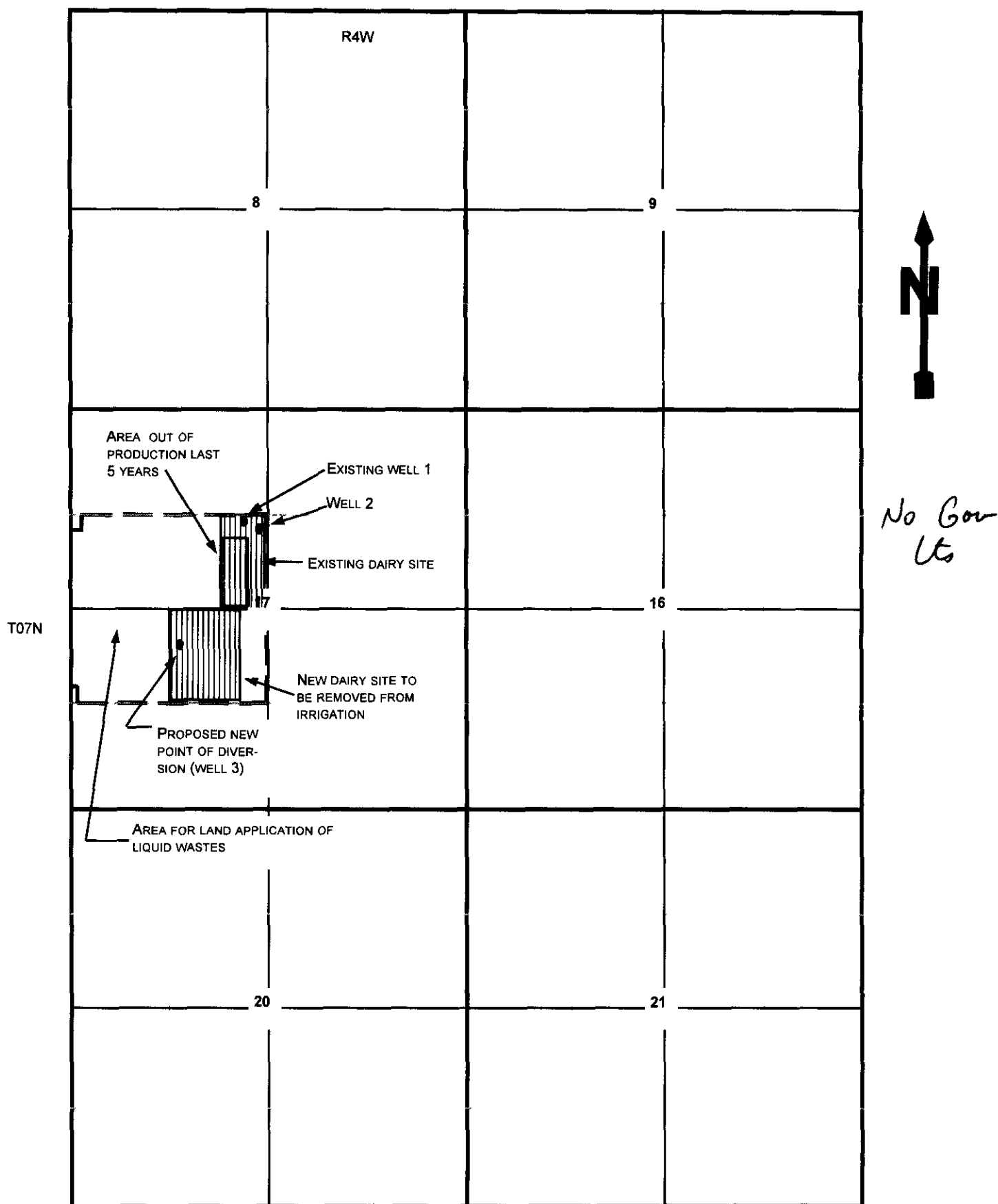
FEB 04 2002

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
APPLICATION FOR PERMIT
TO APPROPRIATE THE PUBLIC WATERS OF THE STATE OF IDAHO

65-22349
AMENDED
3/13/01

- 1 Name of Applicant Frank Teunissen Phone 278-3775 **RECEIVED**
Mailing address 3749 S.W. 3rd Avenue New Plymouth ID 83655 **SEP 25 2001**
- 2 Source of water supply Groundwater which is a tributary of NA
- 3 Location of point of diversion is Township 07N Range 04W Sec 17, in the SE 1/4,
of the NW 1/4, Govt Lot _____, B.M., _____, Payette County, Department of Water Resources
additional points of diversion if any NE 1/4 of the SW 1/4 sec 17 T 07N, R 04 W B.M. (New Well)
- 4 Water will be used for the following purposes
- Amount .5/ 54.23 for stockwater purposes from 1/1 to 12/31 (both dates inclusive)
(cfs or acre-feet per annum)
- Amount .5/ 45.09 for commercial purposes from 1/1 to 12/31 (both dates inclusive)
(cfs or acre-feet per annum)
- FT Amount .5/ .04 for domestic purposes from 1/1 to 12/31 (both dates inclusive)
(cfs or acre-feet per annum)
- Amount _____ for _____ purposes from _____ to _____ (both dates inclusive)
(cfs or acre-feet per annum)
- Amount _____ for _____ purposes from _____ to _____ (both dates inclusive)
(cfs or acre-feet per annum)
- Amount _____ for _____ purposes from _____ to _____ (both dates inclusive)
(cfs or acre-feet per annum)
- 5 Total quantity to be appropriated is (a) .5 (cfs) and/or (b) 99.3 (acre-feet per annum)
- 6 Proposed diverting works
- a Describe type and size of devices used to divert water from the source Two wells with submersible pumps already in use, and a new well with submersible pump to be drilled.
- b Height of storage dam _____ feet; active reservoir capacity _____ acre-feet, total reservoir capacity _____ acre-feet
- c Proposed well diameter is 8 inches, proposed depth of well is 97 feet
- d Is ground water with a temperature of greater than 85°F being sought? No
- e If well is already drilled, when? 1997, Drilling firm, American Well Drilling
Well was drilled for (well owner) Frank Teunissen, Drilling Permit No. 65-97-W-0243-000
- 7 Time required for completion of works and application of water to proposed beneficial use is 1 years (min 1 year)
- 8 Description of proposed uses (if irrigation only, go to item 9)
- a Hydropower, show total feet of head and proposed capacity in kW
- b Stockwatering; list number and kind of livestock 1300 dairy cows, 900 head young stock (see att. A)
- c Municipal, show name of municipality
- d Domestic, show number of households 1 Household
- e Other, describe fully Commercial (see attachment A)

MICROFILMED
FEB 04 2002



FRANK TEUNISSEN	SITE MAP	MICROFILMED
T 07N, R 04W , SEC 17		SCALE 3" = 1 MILE
		FEB 04 2002 PREPARED BY DARWIN VANDER STELT

STATE OF IDAHO
APPLICATION FOR PERMIT

PAGE 2 OF _____

TO APPROPRIATE THE PUBLIC WATERS OF THE STATE OF IDAHO

ID. NO. _____

9 Description of place of use:

- a If water is for irrigation, indicate acreage in each subdivision in the tabulation below.
- b If water is used for other purposes, place a symbol of the use (example D for Domestic) in the corresponding place of use below See instructions for standard symbols

TWP.	RGE.	SEC.	NE 1/4				NW 1/4				SW 1/4				SE 1/4				TOTALS
			NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	
07N	04W	17								S	S								
									C	C	C	C							
										D									

10. Describe any other water rights used for the same purposes as described above None found, though the dairy has operated on a smaller scale at least 20 years.

- 11 a Who owns the property at the point of diversion? Frank Teunissen
- b Who owns the land to be irrigated or place of use? Same
- c If the property is owned by a person other than the applicant, describe the arrangement enabling the applicant to make this filing

12. Remarks: This application replaces the application filed 2/08/01.

- 13 **MAP OF PROPOSED PROJECT REQUIRED** - Attach an 8½"x11" map clearly identifying the proposed point of diversion, place of use, section #, township & range (A photocopy of a USGS 7 5 minute topographic quadrangle map is preferred)

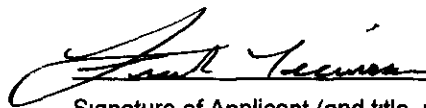
See attachments:

A Quantity calculations

B Maps and drawings

C Nutrient Management Plan detailing wastewater handling

BE IT KNOWN that the undersigned hereby makes this application for permit to appropriate the public waters of the State of Idaho as herein set forth


Signature of Applicant (and title, if applicable)

Received by g Date 3/13 Time 10 AM Preliminary check by g

Fee \$ 250 Receipted by # W027351 Date 2/8/01

Publication prepared by dt Date 4-4-01 Published in Land Enterprise

Publication approved dt Date 6-20-01

Attachment A

Daily Fresh Water Requirement For Dairy Facility Worksheet

For

Drinking Water Estimates (see Table 1 & 2)

			Number	Use/day	Total Gal/Day	Total Gals/Yr.	Acre-feet/Yr (AF/a)
Milking Cows			1100	35	38500		
Dry Cows			200	12	2400		
Total Cows			1300		40900	14,928,500	45.81
Heifers	Age	% of Herd	Number	Use/day	Total		
	16-24 mo	0.38	494	10	4940		
	13-15 mo	0.12	156	8	1248		
	9-12 mo	0.17	221	6	1326		
	5-8 mo	0.17		5	0		
	3-4 mo	0.08	0	4	0		
	0-2 mo	0.08	0	2.5	0		
Total Heifers			871		7514	2,742,610	8.42
Total Herd Drinking Water							54.23

Wash Pen Estimate:

GPM discharge/nozzle				4.04			
Number of Nozzles				150			
Minutes run/day				60			
groups	4						
mins/group	5						
x/day	3						
days per year			300				
Total Wash Pen Water Used:					36360	10,908,000	33.48

Milk House and Parlor Estimate (see Table 4)

Item	Gals/Op	x's/day	Gals/day			
Bulk Tank	250	1	250			
Pipeline	250	3	750			
Backflush	0.5	3	1650			
Cleanup	1500	3	4500			
Cow Prep	0.25	3	550			
Plate Cooler(ignore if recycled)						
Total Milk House and Parlor Water Used:			7700		2,810,500	8.63

Mister Estimate:

123 days	(June-September)					
9 hours/day						
1 lines @	2200 feet/line	1 nozzle/ 5	440	nozzles		
2 gal/hour/nozzle =	880 gals/hour	974160	gals per season	3.0	afa	

Total Fresh Water Diverted Annually (af/a consumptive use) **99.3**

Stock water needed **54.23 afa**

Commercial water needed **45.09 afa**

Prepared by
Darwin Vander Stelt

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FEB 04 2002

RECEIVED

FEB 08 2001

WATER RESOURCES
WESTERN REGIONSTATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
APPLICATION FOR PERMIT
To appropriate the public waters of the State of Idaho

ORIGINAL

1. Name of Applicant Frank Teunissen Phone 278-3205
Mailing address 3749 S.W. 3RD Avenue - New Plymouth, ID - 83655
2. Source of water supply ground water which is a tributary of Payette Drainage
3. Location of point of diversion is Township 7N Range 4W Sec. 17 in the SE $\frac{1}{4}$ of NW $\frac{1}{4}$, Govt. Lot, B.M. Payette County;
additional points of diversion if any: 2 wells in same 40 acres
4. Water will be used for the following purposes:
- | | |
|--|---|
| Amount <u>.5</u> for <u>stock watering</u> | purposes from <u>Jan 1</u> to <u>Dec 1</u> (both dates inclusive) |
| (cfs or acre-feet per annum) | |
| Amount _____ for <u>domestic use</u> | purposes from <u>Jan 1</u> to <u>Dec 1</u> (both dates inclusive) |
| (cfs or acre-feet per annum) | |
| Amount <u>.5</u> for <u>commercial</u> | purposes from <u>Jan 1</u> to <u>Dec 1</u> (both dates inclusive) |
| (cfs or acre-feet per annum) | |
| Amount _____ for _____ | purposes from _____ to _____ (both dates inclusive) |
| (cfs or acre-feet per annum) | |
| Amount _____ for _____ | purposes from _____ to _____ (both dates inclusive) |
| (cfs or acre-feet per annum) | |
| Amount _____ for _____ | purposes from _____ to _____ (both dates inclusive) |
| (cfs or acre-feet per annum) | |
5. Total quantity to be appropriated is (a) .5 and/or (b) _____
cubic feet per second acre feet per annum
6. Proposed diverting works.
- a. Describe type and size of devices used to divert water from the source 2 wells with submersible pumps already in use
- b. Height of storage dam _____ feet; active reservoir capacity _____ acre-feet, total reservoir capacity _____ acre-feet
- c. Proposed well diameter is 6 inches; proposed depth of well is 97 feet
- d. Is ground water with a temperature of greater than 85°F being sought? no
- e. If well is already drilled, when? 1997; Drilling firm American Well Drilling;
Well was drilled for (well owner) Frank Teunissen; Drilling Permit No. 65-97-W-0243-000
7. Time required for completion of works and application of water to proposed beneficial use is _____ years (minimum 1 year)
8. Description of proposed uses (if irrigation only, go to item 9):
- a. Hydropower; show total feet of head and proposed capacity in kW. _____
- b. Stockwatering; list number and kind of livestock. 1100 milking hee, 200 dry cows, 900 weifers
- c. Municipal; show name of municipality _____
- d. Domestic; show number of households. 1
- e. Other; describe fully. Commercial - Use for washing cows

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FEB 04 2002

3. Description of place of use:

a. If water is for irrigation, indicate acreage in each subdivision in the tabulation below.

b. If water is used for other purposes, place a symbol of the use (example: D for Domestic) in the corresponding place of use below. See instructions for standard symbols.

TWP	RGE	SEC	NE				NW				SW				SE				TOTALS
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
7N	4W	17	✓							S									
			✓							C									
			✓							D									

Total number of acres to be irrigated _____

10. Describe any other water rights used for the same purposes as described above. Black Canyon - Full shares for amount of acreage. These wells will not be used for irrigation.

11 a. Who owns the property at the point of diversion? Frank Teunissen

b. Who owns the land to be irrigated or place of use? Frank Teunissen

c. If the property is owned by a person other than the applicant, describe the arrangement enabling the applicant to make this filing: _____

12 Remarks _____

13 **MAP OF PROPOSED PROJECT REQUIRED** - Attach an 8½"x11" map clearly identifying the proposed point of diversion, place of use, section #, township & range. (A photocopy of a USGS 7.5 minute topographic quadrangle map is preferred)

BE IT KNOWN that the undersigned hereby makes this application for permit to appropriate the public waters of the State of Idaho as herein set forth

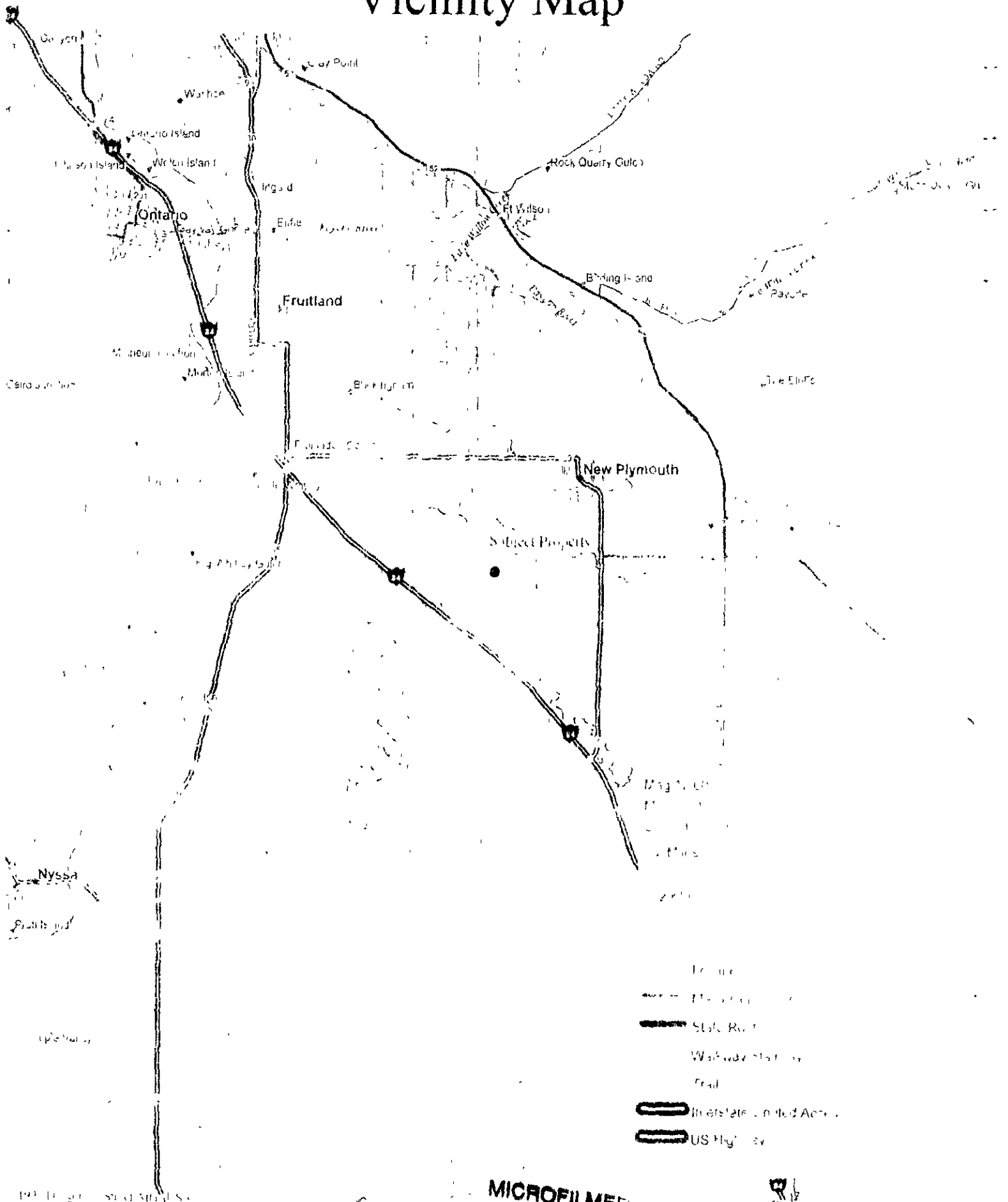
Frank Teunissen
Signature of Applicant (and title, if applicable)

Received by Kh Date 2/8/01 Time 10:22 Preliminary check by _____
Fee \$ 250.00 Received by K1 # W067351 Date 2/8/01
Publication prepared by _____ Date _____ Published in _____
Publication approved _____ Date _____

MICROFILMED

FEB 9 4 2002

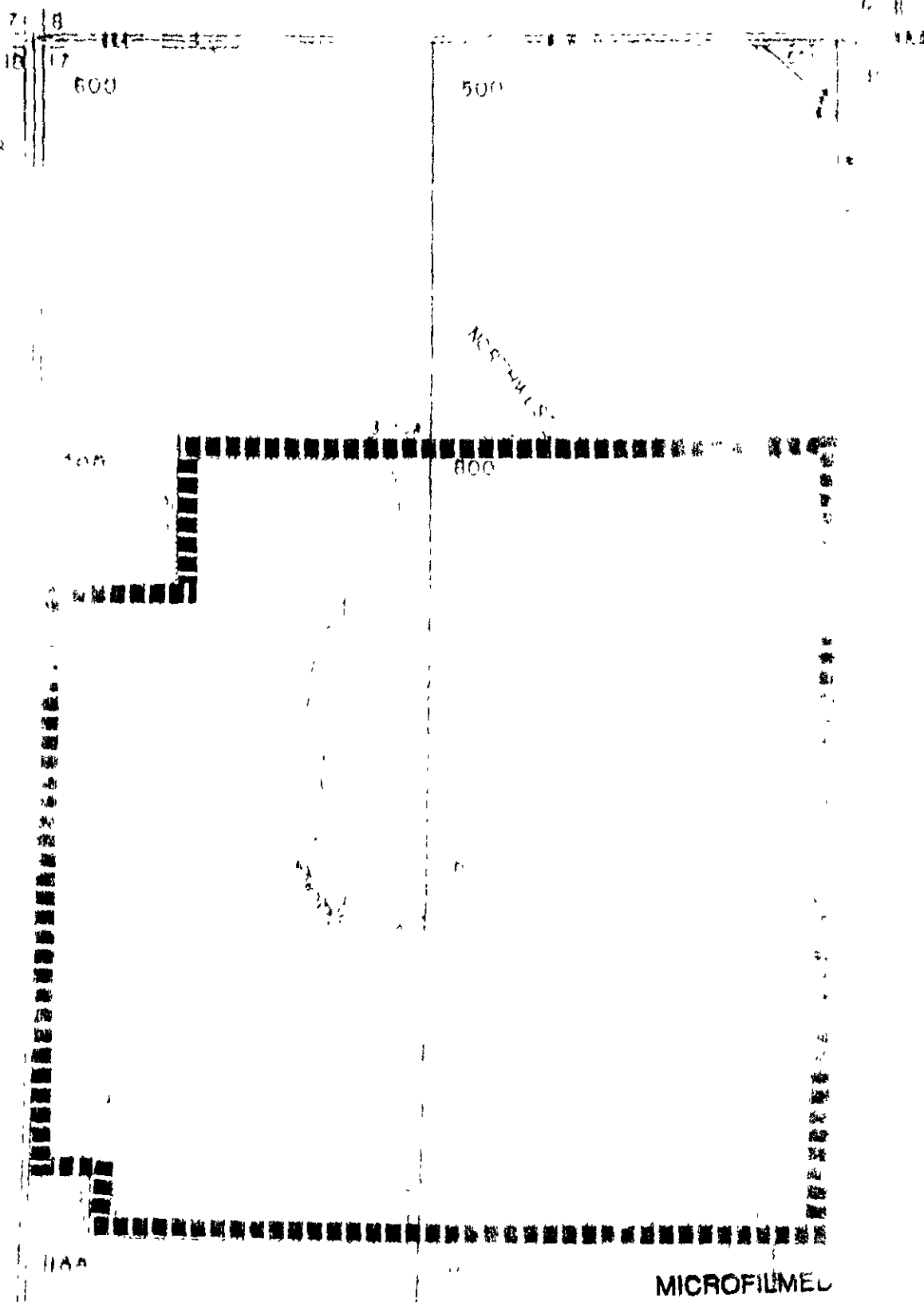
Vicinity Map



MICROFILMED
FEB 04 2002



THE SKETCH BELOW IS MADE SOLELY FOR THE PURPOSE OF ASSISTING IN LOCATING SAID PREMISES AND THE COMPANY ASSUMES NO LIABILITY FOR VARIATIONS IF ANY IN DIMENSIONS AND LOCATIONS ASCERTAINED BY ACTUAL SURVEY.



MICROFILMED

FEB 04 2002



State of Idaho

DEPARTMENT OF WATER RESOURCES

1301 North Orchard Street, Boise, ID 83706 - P.O. Box 83720, Boise, ID 83720-0098
Phone: (208) 327-7900 Fax: (208) 327-7866 Web Site: www.idwr.state.id.us

DIRK KEMPTHORNE
Governor

KARL J. DREHER
Director

September 24, 2002

FRANK TEUNISSEN
3749 SW 3RD AVE
NEW PLYMOUTH ID 83655

RE: PERMIT NO. 65-22349

Dear Permit Holder:

Enclosed is a copy of the approved request for extension of time submitted in connection with the above referenced permit which extends the time within which to submit proof of beneficial use of water to **October 1, 2006**.

Please note that the department granted this extension based on **due diligence**. It is important that you work diligently toward the completion of this project during the construction period allowed since the department **may not** be able to grant additional extensions based on due diligence.

Section 42-248, Idaho Code, requires you or the owner of this water right to maintain current ownership and address records on file with the department. Please contact any office of the department for the proper form to file a change of ownership of a water right and/or a change in the address of the owner.

Please feel free to contact the department if you have questions.

Sincerely,

Deborah J. Gibson
Administrative Assistant
Water Allocation Bureau

Enclosure

c: IDWR - Regional Office

ANALYSIS SHEET FOR EXTENSION OF TIME

Permit No. 65-22349

Reviewed By: dgibson

Date: September 24, 2002

	<u>Yes</u>	<u>No</u>		<u>Yes</u>	<u>No</u>
Request received timely?	X		Is delay by a government agency?		X
Appropriate fee	X		Is supporting documentation needed to support the file?		
Additional Amount Due:					
Receipt No :	W027351, C064676		Has the permit been involved in litigation?		X
Name and signature same as permit?	X		Is supporting documentation needed to support the file?		
Is address same as permit?	X		Is the project more than 25,000 acre feet for irrigation or 10,000 acre feet for a reservoir?		X
Has adequate work been completed to demonstrate due diligence?	X				

Priority Calculation

Extension request received	09/18/2002	New proof due date	10/01/2006
Date proof due	- 10/01/2002		
Lapse notice sent	-		
No of days late	= 0		
Holiday allowance	+		
Priority date	+ 03/13/2001		
New priority date	= 03/13/2001		

Action Taken

Acknowledge request and extend proof deadline to October 1, 2006.

July 31, 2002

FRANK TEUNISSEN
3749 SW 3RD AVE
NEW PLYMOUTH, ID 83655

PROOF DUE NOTICE

RE: PERMIT NO. 65-22349

Dear Permit Holder:

One of the conditions of approval of the above referenced water permit was that proof of the extent of your beneficial use must be submitted to this office on or before October 01, 2002. (See last page of your approval permit or your last approved extension request.) Enclosed is a form which when accompanied by the license examination fee or a completed field examination report prepared by a certified water right examiner may be used to submit the required proof.

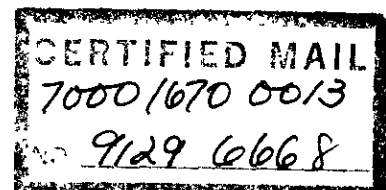
If you have not fully completed your project, and you or a previous owner of this permit have not received a prior extension of time, you may request an extension of time if the delay is for reasonable cause as provided in Section 42-204, Idaho Code. If you have been prevented from proceeding by a governmental agency or by litigation which might bring title to the water in question, more than one extension of time can be granted. An extension of time request form is enclosed for your convenience.

Either an acceptable proof of beneficial use submittal or an acceptable request for an extension of time must be received by this department on or before the above described proof due date. If neither is received, the department will send you a lapse notice. Within sixty (60) days of the mailing of the lapse notice, the permit will no longer be of any force nor effect.

Sincerely,

Deborah J. Gibson, Admin. Assistant
Water Allocation Bureau

Enclosures





State of Idaho

DEPARTMENT OF WATER RESOURCES

1301 North Orchard Street, Boise, ID 83706 - P.O. Box 83720, Boise, ID 83720-0098
Phone: (208) 327-7900 Fax: (208) 327-7866 Web Site: www.idwr.state.id.us

DIRK KEMPTHORNE
Governor

KARL J. DREHER
Director

September 28, 2001

FRANK TEUNISSEN
3749 SW 3RD AVE
NEW PLYMOUTH ID 83655

RE: Permit No. 65-22349

Permit Approval Notice

Dear Permit Holder:

The Department of Water Resources has issued the enclosed permit authorizing you to establish a new water right. Please be sure to thoroughly review the conditions of approval and remarks listed on your permit.

The permit is a PRELIMINARY ORDER issued by the Department pursuant to Section 67-5243, Idaho Code. It can and will become a final order without further action by the Department unless a party petitions for reconsideration or files an exception and/or brief within fourteen (14) days of the service date as described in the enclosed information sheet

Enclosed is a form entitled 'Instructions for Proof of Beneficial Use.' Please read the instructions carefully since you must take further action to develop this permit into a licensed water right. Also enclosed is a form entitled 'Proof of Beneficial Use.' If your project is already completed, you should complete and submit this form immediately.

The right to drill a well is not a part of this permit to appropriate water. Beginning in July of 1987, a statute was enacted which requires a drilling permit for new well construction and deepening of existing wells. If the well(s) proposed for use under this water right permit were drilled or deepened after July 1, 1987, a separate drilling permit must be obtained from this Department. Please contact the Ground Water Protection Section located here at this office or our regional office nearest you.

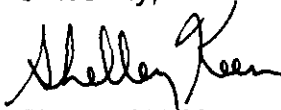
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SEP 04 2002

Also, please note that water right owners are required to report any change of water right ownership and/or mailing address to the Department within 120 days of the change. Failure to report these changes could result in a \$100 late filing fee. Contact any office of the Department or visit the Department's homepage on the Internet to obtain the proper forms and instructions.

If you have any questions, please contact me at 208-327-7946.

Sincerely,

A handwritten signature in cursive script, appearing to read "Shelley Keen".

Shelley W. Keen

Water Rights Supervisor

SWK:klt

Enclosure(s)

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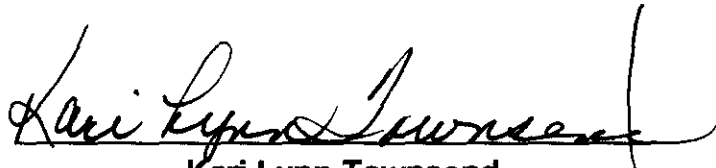
FEB 04 2002

CERTIFICATE OF MAILING

I hereby certify that on September 28, 2001 I mailed a true and correct copy, postage prepaid, of the foregoing PRELIMINARY ORDER(Approved Permit) to the person(s) listed below.

RE: WATER RIGHT NO. 65-22349

**FRANK TEUNISSEN
3749 SW 3RD AVE
NEW PLYMOUTH ID 83655**


**Kari Lynn Townsend
Secretary**

**MICROFILMED
FEB 04 2002**

**EXPLANATORY INFORMATION
TO ACCOMPANY A
PRELIMINARY ORDER**

The accompanying order or approved document is a "Preliminary Order" issued by the department pursuant to section 67-5243, Idaho Code. It can and will become a final order without further action of the Department of Water Resources (department) unless a party petitions for reconsideration, files an exception and brief, or requests a hearing as further described below:

PETITION FOR RECONSIDERATION

Any party may file a petition for reconsideration of a preliminary order with the department within fourteen (14) days of the service date of this order. The department will act on a petition for reconsideration within twenty-one (21) days of its receipt, or the petition will be considered denied by operation of law. See Section 67-5243(3) Idaho Code.

EXCEPTIONS AND BRIEFS

Within fourteen (14) days after (a) the service date of a preliminary order, (b) the service date of a denial of a petition for reconsideration from this preliminary order, or (c) the failure within twenty-one (21) days to grant or deny a petition for reconsideration from this preliminary order, any party may in writing support or take exceptions to any part of a preliminary order and may file briefs in support of the party's position on any issue in the proceeding with the Director. Otherwise, this preliminary order will become a final order of the agency.

REQUEST FOR HEARING

Unless a right to a hearing before the department or the Idaho Water Resource Board (Board) is otherwise provided by statute, any person aggrieved by any final decision, determination, order or action of the Director of the department and who has not previously been afforded an opportunity for a hearing on the matter may request a hearing pursuant to section 42-1701A(3), Idaho Code. A written petition contesting the action of the Director and requesting a hearing shall be filed within fifteen (15) days after receipt of the denial or conditional approval.

ORAL ARGUMENT

If the Director grants a petition to review the preliminary order, the Director shall allow all parties an opportunity to file briefs in support of or taking exceptions to the preliminary order and may schedule oral argument in the matter before issuing a final order. If oral arguments are to be heard, the Director will within a reasonable time period notify each party of the place, date and hour for the argument of the case. Unless the Director orders otherwise, all oral arguments will be heard in Boise, Idaho.

CERTIFICATE OF SERVICE

All exceptions, briefs, requests for oral argument and any other matters filed with the Director in connection with the preliminary order shall be served on all other parties to the proceedings in accordance with IDAPA Rules 37.01.01302 and 37.01.01303 (Rules of Procedure 302 and 303).

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FEB 04 2002**

FINAL ORDER

The Director will issue a final order within fifty-six (56) days of receipt of the written briefs, oral argument or response to briefs, whichever is later, unless waived by the parties or for good cause shown. The Director may remand the matter for further evidentiary hearings if further factual development of the record is necessary before issuing a final order. The department will serve a copy of the final order on all parties of record.

Section 67-5246(5), Idaho Code, provides as follows:

Unless a different date is stated in a final order, the order is effective fourteen (14) days after its issuance if a party has not filed a petition for reconsideration. If a party has filed a petition for reconsideration with the agency head, the final order becomes effective when:

- (a) the petition for reconsideration is disposed of; or
- (b) the petition is deemed denied because the agency head did not dispose of the petition within twenty-one (21) days.

APPEAL OF FINAL ORDER TO DISTRICT COURT

Pursuant to sections 67-5270 and 67-5272, Idaho Code, if this preliminary order becomes final, any party aggrieved by the final order or orders previously issued in this case may appeal the final order and all previously issued orders in this case to district court by filing a petition in the district court of the county in which:

- i. A hearing was held,
- ii. The final agency action was taken,
- iii. The party seeking review of the order resides, or
- iv. The real property or personal property that was the subject of the agency action is located.

The appeal must be filed within twenty-eight (28) days of this preliminary order becoming final. See section 67-5273, Idaho Code. The filing of an appeal to district court does not itself stay the effectiveness or enforcement of the order under appeal.

**APPLICATION FOR PERMIT
STATE OFFICE ANALYSIS**
Reviewed by Sharla Curtis on 9/26/01

No. 65-22349 Name: Jewissen Corp. Officers N/A Ad ok ☒ Govt Lots

AREA OF CONCERN: No/Yes Moratorium ~~GWMA~~ TRUST/NON-TRUST

GROUNDWATER: (√Flow Chart)

DRILLING PERMIT

All wells - 046
Basin 34 - 084 (if necessary)
WMD - North/East/West
≤ 0.24 cfs/5 acres - No MD
> 0.24 cfs/5 acres - 067

~~WMD~~

Supp irr (irr = only use) - 065-104
Supp irr (+ other uses) - 100-105
≤ 0.24 cfs/5 acres - No MD
> 0.24 cfs/5 acres - 01M

LOCATION:

Boise Front LoGeo - 058 (<85 GW)
Mitigation - 121

Trust - 051 (consumptive uses)
Non-Trust - 048-049 (consumptive uses or non-cons > 1/0 cfs)

USES:

STORAGE - 18C-01H-01P-18B-NA
IRR ≤ 5 ac - R66/R67/R68/R69 (0.03 cfs/ac)
 > 5 ac - R62/R63/R64/R65 (0.02 cfs/ac)
STOCK WATER - R37 (BLM/FS)-111 (instream stock)
MINING - 054-106
HEAT/COOL - R07 (injection well)
FIRE PROT - 077
COMMERCIAL/
INDUSTRIAL - 106-R07 *Not needed in this case*
DAIRY - 082-WD8
POWER - 17H or 17K (+uses)-17G (under FERC)
 or 17M (not FERC regulated)
 025-027-R22-08A

BENEFICIAL USE DUE: 10/01/2002

MISC CONDITIONS/REMARKS:

Protested - 020-W19
Development Period
 > 1 yr - 26A
Ownership - 004
Non-consumptive - 027
Water Quality - 106-R07

SURFACE WATER: (√Flow Chart)

F&G contacted - Yes/No Response
In/Above MSF - WB9

PLANNING REVIEW/RESPONSE

WD - R04 (WD#)
≤ 0.20 cfs/others - 01H, 01P or No MD
> 0.20 cfs - 01J

SPRINGS/SINK, INACTIVE WD or WB

≤ 0.24 cfs/5 acres - No MD
> 0.24 cfs/5 acres - 01M or No MD

RIVER BASINS: (SW special considerations)

Snake R (01) - W23, N/A
 (02,03) - 007 (w/ remark WB9 if above Weiser)
Payette R (65) - W23, 047 (Payette Lake)
Salmon R (70's) - 029 (fish screens)
Weiser R (67) - 086-087

USES:

MUNICIPAL

Restricted area - 022,075
Irr., GW supp to SW - 102
Future needs - 007,109
FISH PROP - 029 (70's only)-007-042-106

DOMESTIC

Surface water W01 ① - WB5 (Big Wood/Boise above Star Bridge)
- 27A (Payette R)
 > 1 in restricted area - 070-071-075 (no parks/common areas)
Irr separate or none allowed - WB5
GW w/irrigation from SW evident - 065-104
Moratorium approvable - W03 (2500 gpd - meets domestic def
 1 e D/convenience store)

Multiple pd's per ¼¼ - W32
Subd lot desc (pd) - W59
Subd lot desc (pu) - W60
Use definitions - W02 example - S/50 range *1300 dairy, 900 head young stock*
Pre-1987 development - 068-074 (allow 120 days for proof due)
Single p/d intended - 076

IRRIGATION SEASON (Per updated map)

IRR VOLUME/ACRE

OTHER CONDITIONS/REMARKS C/dairy

COMMENTS

I. IHO DEPARTMENT OF WATER RESC CES
APPROPRIATION APPLICATION ANALYSIS SHEET

*send comment to
dept of ag*

INITIAL REVIEW BY: 6 DATE: 3/15/01 APPLICATION: 65-22349

REQUIRED INFORMATION

- ☒ Name: (If applicant is a corporation or partnership, names and addresses for the director, officers, and other partners must be included.)
- ☒ Address:
- ☒ Source: (See USGS Quad for names of water sources)
- ☒ Point of Diversion: (10 acres for spring, lot & block descriptions for Subdivisions, local name)
- ☒ County:
- ☒ Quantity: (flow and/or volume)
- ☒ Period of use:
- ☒ Nature of proposed use: (Include description of use)
- ☒ Description of diverting works:
- ☒ Time required for beneficial use of water:
- ☒ Place of use or acres irrigated:
- ☒ Map: (show T, R, S, QQ &/or QQQ)
- ☒ Subdivision plat: (for > 1 home in restricted area. $\geq$ 5 homes in non-restricted area)
- ☒ Signature: (If applicant is corp., partnership, or municipality, title of signatory is required)
- ☒ Correct fee paid

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SEP 25 2001

Gov't. Lots:
☒ P/D
☒ P/U

Department of Water Resources

Y ADVERTISE REMARK(S)
(Reviewer identify which remarks)

ADDITIONAL INFORMATION

YES NO

- ☒ ☐ Overlapping place of use: (Describe source & relationship to present application on next page.)
- ☐ ☒ Overlapping point of diversion.
- ☐ ☒ Critical groundwater area:
- ☐ ☒ Groundwater management area:
- ☐ ☒ 1992 moratorium:
- ☐ ☒ Surface water source, IDFG letter needed.
- ☐ ☒ Protected river or minimum flow reach, notify water planning bureau.
- ☐ ☒ E-mail to SCA staff: (perennial stream, non-pump diversion &/or any mining).
- ☐ ☒ E-mail to Dam Safety staff: (for any storage)
- ☒ ☐ Mitigation plan: Check any that apply.
- ☐ ☐ immediate = acceptable plan required and submitted.
- ☒ ☐ future = open areas, acceptance of condition of approval is in file.
- ☐ ☒ Send power requirement letter &/or fish farm requirement letter.
- ☐ ☒ Power residency affidavit:
- ☐ ☒ Diversion greater than 5 cfs or 500 af or irrigation greater than 200 acres: (If yes, attach Large Diversion supplementary analysis sheet.)
- ☒ ☐ *REQUEST ADDITIONAL INFORMATION FROM THE APPLICANT

see attached letter dated 2/13/01

Date Requested 2/13/01 Date Response Received 3/13/01

PROCESSING

APP. NO. 25-22349

YES NO

☒ ☐ In form for advertising:
☒ ☐ Statewide advertising: (> 10 cfs &/or 1000 af)
☒ ☐ Fee amount, receipt number and date recorded on application:

SEND COPIES TO: NOTE IF E-MAIL COMMENT LETTER USED.

YES NO

☐ ☒ I.D. Health & Welfare
☐ ☒ I.D. District Health
☐ ☒ I.D. Fish & Game
☐ ☒ I.D. Lands

YES NO

☐ ☒ U.S. BLM
☐ ☒ U.S. Forest Service
☐ ☒ Water Dist. #
☐ ☒ Water Planning Bureau
☒ ☐ Other Dept of Ag

FINAL REGIONAL PROCESSING REVIEW:

YES NO

☒ ☐ Affidavit of publication received:
☒ ☐ Application published correctly: If not, record action taken.

☒ ☐ Publication dates and paper recorded on application:
☐ ☒ Final date for protest 4-23-01 6-25-01
☐ ☒ Protests received.
☐ ☒ Recommendations attached:
☐ ☒ Measuring device required:
☐ ☒ Water delivered by water master? District #
☒ ☐ Special conditions of approval or cover letter: 046, 121, standard dairy conditions.

See below for additional information

Recommended Date or Priority 2/8/01
 Recommended by: Gary Date: 9/19/01

ADDITIONAL INFORMATION:

overlap: 465-04588 - dom/stock claim
diff P/D (in SWNW)

RECEIVED

AUG 20 2001

WATER RESOURCES
WESTERN REGION

PAYETTE COUNTY
PLANNING AND ZONING

PAYETTE COUNTY COURTHOUSE
P.O. BOX DRAWER D
PAYETTE, IDAHO 83661
PHONE (208) 642-6018

July 14, 2000

Frank and Leslie Teunissen
3749 SW 3rd Ave
New Plymouth ID 83655

Re: Conditional Use Permit

Dear Frank and Leslie

On July 13, 2000 the Payette County Planning and Zoning Commission met at a regular scheduled meeting. After discussing information gathered from a public hearing, the Commission voted to approve your request for a conditional use permit. This conditional use permit will allow you to operate and expand your dairy operation within the limits outlined by your application. This permit does not include or address any additional requirements of the State of Idaho or the Federal Government.

Building permits are required for any structures built that have roof areas more than 120 Square Feet.

If you have any questions or concerns, please stop by the office or give us a call at 208) 642-6018.

Sincerely,

Donald L. Dressen

Donald L. Dressen
Administrator
Payette County Planning & Zoning

cc: Kris Lane, Chairman, Planning and Zoning Commission
Ken Gissel, Chairman, Board of County Commissioners
File

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SEP 04 2002

FINDINGS OF FACT, CONCLUSIONS OF LAW AND ORDER IN THE
MATTER OF THE REQUEST OF FRANK TEUNISSEN AND LESLIE TEUNISSEN,
HUSBAND AND WIFE FOR A CONDITIONAL USE PERMIT TO OPERATE A DAIRY.

A public hearing was held to consider a request for a conditional use permit to operate a dairy. The request affects lands located at 3749 SW 3rd Avenue, New Plymouth, Payette County, Idaho. The zoning administrator published notice and the hearing was held by the Payette County Planning and Zoning Commission on July 13, 2000. The Commission makes it's Findings, it's Conclusions and it's Order based upon the record, which includes the application, the hearing, a commission viewing of the property, testimony and exhibits. The viewing was done pursuant to a published agenda.

Standards Applied

In reaching it's decision, the Commission relies upon Section 67-6502, Idaho Code; Section 67-6512 Idaho Code; Title 8 of the Payette County Code (formerly known as the Payette County Zoning Ordinance; the Payette County Comprehensive Plan.

Chapter 8 of Title 8 of the Payette County Code allows for certain land uses through the Conditional use process. Section 8-8-2 reads as follows:

8-8-2 ZONE A (PRIME AGRICULTURAL): The following uses are permitted in "A" zones.

A. A single family dwelling used as a farm or ranch house, farm labor house, garden buildings and accessory structures. Cultivation, harvesting, storage and sale of crops, vegetables, fruits, plants, flowers and nursery stock produced on the premises. Plant and material nursery.

B. Radio and television transmitting stations, by Conditional Use Permit; airports, cemeteries, fairgrounds, home occupations, commercial packing plants for farm crops, preschool nurseries by Conditional Use Permit; gravel pits, extractive manufacturing and quarries, by Conditional Use Permit; riding stables, commercial feed lots, kennels, veterinary or animal hospitals, livestock and poultry raising and feeding, commercial slaughterhouses and meat packing facilities, by Conditional Use Permit.

8-8-10: CONDITIONAL USES: Since it is impossible to foresee and enumerate all future or potential and valid conditional

uses, other conditional uses may be approved by the Planning and Zoning Commission, provided the proposed use conforms strictly to the requirements of Chapter 9 of this Title.

8-9-3 GENERAL STANDARDS APPLICABLE TO ALL CONDITIONAL USES: The Commission shall review the particular facts and circumstances of each proposed conditional use in terms of the following standards and shall find adequate evidence showing that such use at the proposed location:

1. Will, in fact, constitute a conditional use.
2. Will be harmonious with and in accordance with the general objectives or with any specific objective of the Comprehensive Plan and the Zoning Ordinance;
3. Will be designed, constructed, operated and maintained to be harmonious and appropriate in appearance with the existing or intended character of the general vicinity and that such use will not change the essential character of the same area;
4. Will not be hazardous or disturbing to existing or future neighboring uses;
5. Will be served adequately by essential public facilities and services such as highways, streets, police and fire protection, drainage structures, refuse disposal, water and sewer and school; or that the persons or agencies responsible for the establishment of the proposed use shall be able to provide adequately any such services;
6. Will not create excessive additional requirements at public cost for public facilities and services and will not be detrimental to the economic welfare of the community;
7. Will not involve uses, activities, processes, materials, equipment and conditions of operation that will be detrimental to any persons, property or the general welfare by reason of excessive production of traffic, noise, smoke, fumes, glare or odors;
8. Will have vehicular approaches to the property which shall be so designed as not to create an interference with traffic on surrounding public thoroughfares; and
9. Will not result in the destruction, loss or damage of a natural, scenic or historic feature of major importance.
10. A conditional Use is deemed personal in nature and cannot be transferred with title to the property.

MICROFILMED,

-2-FEB 04 2002

cu-dairy
Teunissen

FINDINGS OF FACT

Some time ago, the Applicants purchased an existing dairy. At the time of the purchase they were informed that, since the dairy was an existing business, it was grandfathered in and Applicants would not have to apply for any new conditional use permits. Since in the past the property had previously been used as a dairy, the Applicants did not feel it was necessary to obtain any kind of a permit.

At present the Applicants are milking 550 head of cows. With dry and replacement stock they are feeding approximately 750 head total. They would like to expand their operation to 2200 head. That would consist of 250 dry cows, 1100 milking cows, 850 replacement cows.

Applicants testified that they are in compliance with all state laws and are working on a waste management plan. They presently operate a grade A dairy and the desired expansion would take several years to accomplish. Applicants testified that in order to remain competitive, they have to increase the size of their business.

The Conditional Use Process was followed in this matter and landowners owning property within 300 feet were notified of the requested permit.

One adjoining landowner, Rick Strawn, appeared and raised several objections to the requested conditional use permit. He owns property adjacent to the dairy and felt that by allowing the conditional use permit, his investment property would be adversely impacted. He also objected to the visual pollution, water pollution, noise, air pollution and to the fact that the Applicants were using his roadway to access their property.

Both the Payette County Comprehensive Plan and the Payette County Zoning Ordinance designate the area as A-Agricultural.

After holding a public hearing, granting or denying a permit is discretionary with the Zoning Commission. The burden to show that the requirements of Title 8 are satisfied are on the applicant.

1. A dairy is not enumerated as either a permitted use nor as a conditional use by Payette County Code, Title 8. A large dairy is an agri-business pursuit and needs to be permitted under the condition use process of the County Code.

2. A large dairy operation is not inconsistent with the general objectives of the Comprehensive Plan nor of Title 8 of

MICROFILMED

(

the Payette County Code, which is also referred to as the Zoning Ordinance. While a dairy is not listed in title 8 of the Payette County Code as a favored use, neither is it a prohibited use. A dairy operation is a use which is consistent with agricultural pursuits. The property has been used as dairy in the past.

3. A dairy would not change the essential character of the area.

4. Neither the existing dairy nor the preceding dairy operation has been a nuisance to surrounding neighbors, except to Rick Strawn.

5. There was no testimony regarding services provided by essential public facilities and services.

6. The proposed use would not be significantly detrimental to the economic welfare of the community.

7. The proposed use would not create excessive additional requirements at public cost.

8. The proposed dairy operation will create odors. The Applicants waste management plan should be used to control or reduce objectionable odors.

9. The proposed use would not result in the destruction, loss or damage of a natural, scenic or historic feature of major importance.

The action of the Commission does not result in either a permanent or temporary physical occupation of private property.

The action does not require the owner to dedicate any property as an easement.

The action does not deprive the owner of all economically viable uses of the property.

The regulation does not have significant impact on the landowner's economic interest. Since the zoning is not changed in any way, the economic impact is insignificant.

The action does not deny the Applicant of any fundamental attribute of ownership, including the right to possession.

Since the restrictions upon the land were the same before the action as they are after the action, the net affect of the Commission action is minimal.

Affected Property

The address for the affected property is 3749 SW 3rd Avenue, New Plymouth, Payette County, Idaho.

A portion of land n the SE 1/4 NW 1/4 and the NE 1/4 SW 1/4 of Section 17, Twp 7 N. R 4 W.B.M., Payette County Idaho.

CONCLUSIONS

The granting or denying of a request for a permit for a conditional use is discretionary with the Planning and Zoning Commission.

The Applicants have met their burden to establish grounds which would justify the issuance of a conditional use.

ORDER

The Applicants' request for a conditional use permit to operate a dairy is hereby granted.

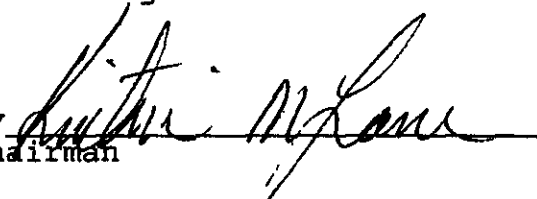
ALTERNATIVES

Any aggrieved person may pursue the following alternative. By listing this alternative the commission does not in any way mean to imply that if the alternative is pursued, that the aggrieved person will be successful or unsuccessful.

Any person aggrieved by the action of the Commission may appeal the decision of the Commission, to the Board of County Commissioners within the time limit allowed by law.

Approved by the Payette County Planning and Zoning Commission, this 15th day, of August, 2000.

Payette County Planning
and Zoning Commission

by 
Chairman

Attest:


Secretary

MICROFILMED

SEP 9 2000

cu-dairy
Teunissen

APPLICATION FOR WATER RIGHT

The following application(s) have been filed to appropriate the public waters of the State of Idaho

65-22349

FRANK TEUNISSEN
3749 SW 3RD AVE.
NEW PLYMOUTH, ID 83655

Point(s) of Diversion	SENW S17 T07N R04W PAYETTE County	Source: GROUND WATER GROUND WATER GROUND WATER
Point(s) of Diversion	SENW S17 T07N R04W PAYETTE County	Source: GROUNDWATER GROUND WATER GROUND WATER
Point(s) of Diversion	NESW S17 T07N R04W PAYETTE County	Source: GROUND WATER- GROUNDWATER GROUNDWATER

Use COMMERCIAL	01/01 To 12/31 0.5 CFS
Use STOCKWATER	01/01 To 12/31 0.5 CFS
Use DOMESTIC	01/01 To 12/31 0.04 CFS
Total Diversion:	0.5 CFS

Date Filed: 03/13/2001

Place Of Use COMMERCIAL
T07N R04W S17 SWNW SENW NESW NWSW

Place Of Use STOCKWATER
T07N R04W S17 SENW NESW

Place of Use DOMESTIC
T07N R04W S17 SENW

Remark Applicant agrees to mitigate consumptive use in the future as needed

Permits will be subject to all prior water rights. Protests may be submitted based on the criteria of Sec. 42-203A, Idaho Code

Any protest against the approval of this application must be filed with the Director, Dept. of Water Resource, Western Region, 2735 Airport Way, Boise, ID 83705 together with a protest fee of \$25 00 for each application on or before 6/25/01. The protestant must also send a copy of the protest to the applicant.

KARL J DREHER, Director
No 676

June 6, 13

Affidavit of Publication

STATE OF IDAHO,
COUNTY OF PAYETTE

ss.

Copy of Notice
(First Copy)

Application for Water Right
TITLE OF PUBLICATION

65-22349

Dept. of Water Resource
SPONSOR OF PLAINTIFF
PLAINTIFF OR LEGAL AGENT

I, Viola M Hawkins, being

duly sworn, deposes and says:

That She is the principal clerk of

THE INDEPENDENT-ENTERPRISE, a weekly newspaper published at Payette, in the County of Payette and State of Idaho; that said paper has been and is in general circulation in the county aforesaid, and in the vicinity of Payette; that the advertisement, a copy of which is attached hereto, was published in said newspaper once a week for two consecutive weeks in the regular and entire issue of said paper during the period and time of publication, and was published in the newspaper proper and not a supplement; that said paper has been established and regularly published for more than seventy-eight consecutive weeks prior to the date of first publication of said advertisement.

Such notice was published in the issue beginning with June 6, 2001, 19____, and ending with the issue of June 13, 2001, 19____.

STATE OF IDAHO
COUNTY OF

On this 14th day of June, in the year of 2001, before me, a Notary Public, personally appeared Viola Hawkins known or identified to me to be the person whose name subscribed to the within instrument, and being by me first duly sworn, declared that the statements therein are true, and acknowledged to me that he executed the same.

Michael D. Rinehart
Notary Public for Idaho

Residing at Payette, Idaho

My commission expires: 12-1-04

RECEIVED

JUN 15 2001

WATER RESOURCES
WESTERN REGION

STATEMENT

Independent-Enterprise

PAYETTE, IDAHO

Number of Lines 39x4 columns

Number of Insertions (2) two

39 Lines @ 2.38 ... \$ 92.82

39 Lines @ 2.04 ... \$ 79.56

TOTAL COST
WILL BE \$ 172.38

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Nº 676



State of Idaho

DEPARTMENT OF WATER RESOURCES

Western Region, 2735 Airport Way, Boise, Idaho 83705-5082 - (208) 334-2190

FAX (208) 334-2348

DIRK KEMPTHORNE
Governor

KARL J. DREHER
Director

April 2, 2001

DEPT OF AGRICULTURE
2270 OLD PENITENTIARY RD
BOISE ID 83712

Re: Application for Water Right No. 65-22349 in the Name of Frank Teunissen

Dear Sir:

Enclosed is a copy of the above-referenced application for permit that the proposed use is from surface water. Please review the application and submit any comments you may have.

This office normally completes the processing of an application within a six-week period and is required to take final action shortly thereafter. However, if your agency desires to file a formal protest against the approval of this application(s), your written protest along with the \$25.00 protest fee must be received in this office by April 23, 2001.

If you have any questions regarding the application, please contact this office.

Sincerely,

A handwritten signature in cursive script that reads "Gary Spackman".

Gary Spackman

GS:lm

Encl.: Copy of Application

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REQUEST TO PROCESS

COMPLETE REQUEST IF YOU WANT YOUR APPLICATION TO BE PROCESSED USING ONE OF THE
THREE ALTERNATIVES BELOW

Name of Applicant

Frank Tounissen

Mailing Address

3749 S.W. 3rd

New Plymouth ID

Application No.
(if known)

 IN LOCAL PUBLIC INTEREST

Yes, I want my application processed and before it is advertised, I will amend my application to demonstrate that the proposed appropriation is in the local public interest including the need to preserve flows in the Snake River during the migration periods of anadromous fish.

 PROPOSE MITIGATION NOW

Yes, I want my application processed and before it is advertised, I will amend my application to include proposed mitigation to offset anticipated depletions in the Snake River during periods of anadromous fish migration.

 / WILL AGREE TO MITIGATION IN THE FUTURE IF NECESSARY

Yes, I want my application processed at this time, and I will accept a condition of approval that will require mitigation should the Director of the Idaho Department of Water Resources determine that mitigation is necessary to offset depletions from this appropriation to flows in the Snake River during periods of anadromous fish migration. I understand that mitigation is not required now but may be needed in the future. I also understand that the Director will not require mitigation until I have an opportunity to review the process by which the need for mitigation is established and the amount of water required is quantified.

Signature

Frank Tounissen

Date

3/13/01

Please return this form to:

Idaho Dept. of Water Resources
Western Regional Office
2735 Airport Way
Boise, ID 83705-5082

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MEMORANDUM

TO: Lori Graves

FROM: Darwin Vander Stelt, preparer

DATE: March 13, 2001

RE: Frank Teunissen , Application for permit to appropriate water

The applicant wishes to expand the dairy beyond the size allowed by his current water right. The current right is undetermined as the dairy has been in existence long before 1987, yet does not seem to have filed for any stockwater right.

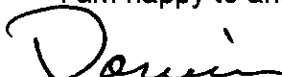
This new application is for a new facility to be constructed on the property.

DOCUMENTS AND APPLICATION PREPARATION

- A. Dairy Water Requirement Worksheet
- B. Map of vicinity
- C. Current nutrient management plan showing disposition of return flows.

The required response to the four issues in Idaho Code Section 42-222 will be provided after advertising is complete.

I am happy to answer any further questions about this application. Thank You!


Darwin

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State of Idaho

DEPARTMENT OF WATER RESOURCES

Western Region, 2735 Airport Way, Boise, Idaho 83705-5082 - (208) 334-2190

FAX (208) 334-2348

2/13/01

DIRK KEMPTHORNE
Governor

KARL J. DREHER
Director

Frank Teunissen
3749 SW 3rd Ave
New Plymouth ID 83655

RE: APPLICATION FOR PERMIT FOR DAIRY

Dear Mr. Teunissen:

We received your application for permit on 2/8/01. Advertising this application will be delayed until our office receives the following information.

INFORMATION REQUIRED PRIOR TO ADVERTISING:

- 1.) Please explain how you plan to manage your dairy waste water and if land applying, mark on the enclosed map the area in which that will occur.
- 2.) The wells were listed in the SENW on the application and the enclosed map shows the dairy in the SENW, however the uses are listed in the NENE on the application. Please initial the place of use correction to the SENW.
- 3.) Please choose one of the three choices on the enclosed "Request to Process Form". The Request to Process Form and explanation letter have been enclosed.

In order to process all of the applications in our office as efficiently as possible, we are required by Idaho Code § 42-204 to ask that the above information be sent to our office within 30 days or we are to void the application for permit. **Therefore, if we do not receive the above information by 3/15/01 we will be forced to void your application for permit.** If your application is voided you will be able to re-file with a later priority date.

INFORMATION REQUIRED AFTER ADVERTISING:

When reviewing applications, our office is required to address the following review requirements per Idaho Code § 42-203A – section 5:

- (a) That it will reduce the quantity of water under existing water rights, or (b) that the water supply itself is insufficient for the purpose for which it is sought to be appropriated, or (c) where it appears to the satisfaction of the director that such application is not made

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in good faith, is made for delay or speculative purposes, or (d) that the applicant has not sufficient financial resources with which to complete the work involved therein, or (e) that it will conflict with the local public interest, where the local public interest is defined as the affairs of the people in the area directly affected by the proposed use, or (f) that it is contrary to conservation of water resources within the state of Idaho

This letter requests information relative to the following:

Local Public Interest

Explain in detail the current process for approval of the project by local governments responsible for granting permission for the project. If a local jurisdiction is not required to approve the proposed project, you should obtain a comment letter regarding the project from the Payette County Commissioners or from a person designated by the commissioners to act on their behalf.

Also please explain in detail the current process of review/approval of your proposed project by the Idaho Department of Agriculture. The explanation should include a showing that the proposed project has been approved or that approval by Department of Agriculture is imminent.

You must demonstrate that local residents have been notified of your proposal and have been afforded a meaningful opportunity to review the proposal.

Injury to Other Water Users

Please explain waste management techniques that will protect other water users from ground water contamination and surface water users from release of waste into surface channels or delivery canals.

This information will not be requested until after the application's final protest date. If your application is protested you will need to have this information available for the protest negotiations.

Please contact me at the above address or telephone number if you have any questions.

Sincerely,



Lori Graves
Sr. Water Right Agent

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Teunissen Dairy

Nutrient Management Plan

March 7, 2001

Nutrient Management Plan Prepared For:

Frank Teunissen
3749 SW 3rd
New Plymouth, ID 83655

Certified Planner: Darwin Vander Stelt

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Facility Information Sheet

Facility	Teunissen Dairy		
Operator Information	Frank Teunissen		(208) 278-3205
	3749 SW 3rd		(208) 741-3353
	New Plymouth, ID 83655		
Legal Description	T7N R4W Sec 17		
County	Payette County		
Soil Conservation District	Payette County SCD		
Watershed Basin	Southwest		
Hydrologic Unit Code #	17050122		
Stream Segment	Payette River (2689)		
GPS	N43° 56 95' W116° 50 55'		

	Nitrogen (lbs)	% of Total Produced	Phosphorus (lbs)	% of Total Produced	Potassium (lbs)	% of Total Produced
Nutrients Exported	54,704	82%	24,240	83%	101,952	83%
Animal Nutrients Applied	11,649	18%	5,129	17%	20,940	17%
Commercial Nutrients Applied						

Limiting Resource	Groundwater > 5'	Vulnerability	Low
Plan Designed to		1.5x Crop Uptake	
AU on the facility	1340		
Total Acres Available for Nutrients			
Owned by the Facility	136		
Animal Equivalent Units per Acre		1.7	

Action Required	Compliance Date	Completion Date
Containment Upgrade Required	10/1/2001	
Irrigation Mechanical Upgrade Required.		
Irrigation Management Upgrade Required		
Water Quality Related Practice Required		

Certified Planner _____ Date _____
 Darwin Vander Stelt (# 212)

Operator _____ Date _____
 Frank Teunissen

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Producer Summary

Facility Summary

The Teunissen Dairy is an existing dairy facility located in New Plymouth, Idaho at 3749 SW 3rd, and is operated by Frank Teunissen

The purpose of this nutrient management plan is to inform the producer and others of the value of animal waste and to certify that nutrients are utilized in an appropriate way which will not adversely impact surface or groundwater

The Teunissen Dairy milks 600 Holstein cows and also maintains 119 mature dry cows and 324 heifers of above 13 months of age. The animals are housed in open corrals which are bedded with straw. Manure and straw bedding is scraped and piled in the corrals or in storage areas until it can be hauled away. The dairy owns 136 acres of irrigated cropland. The crop rotation is sudan and alfalfa in rotation or Mattua bromegrass.

Resource Concerns

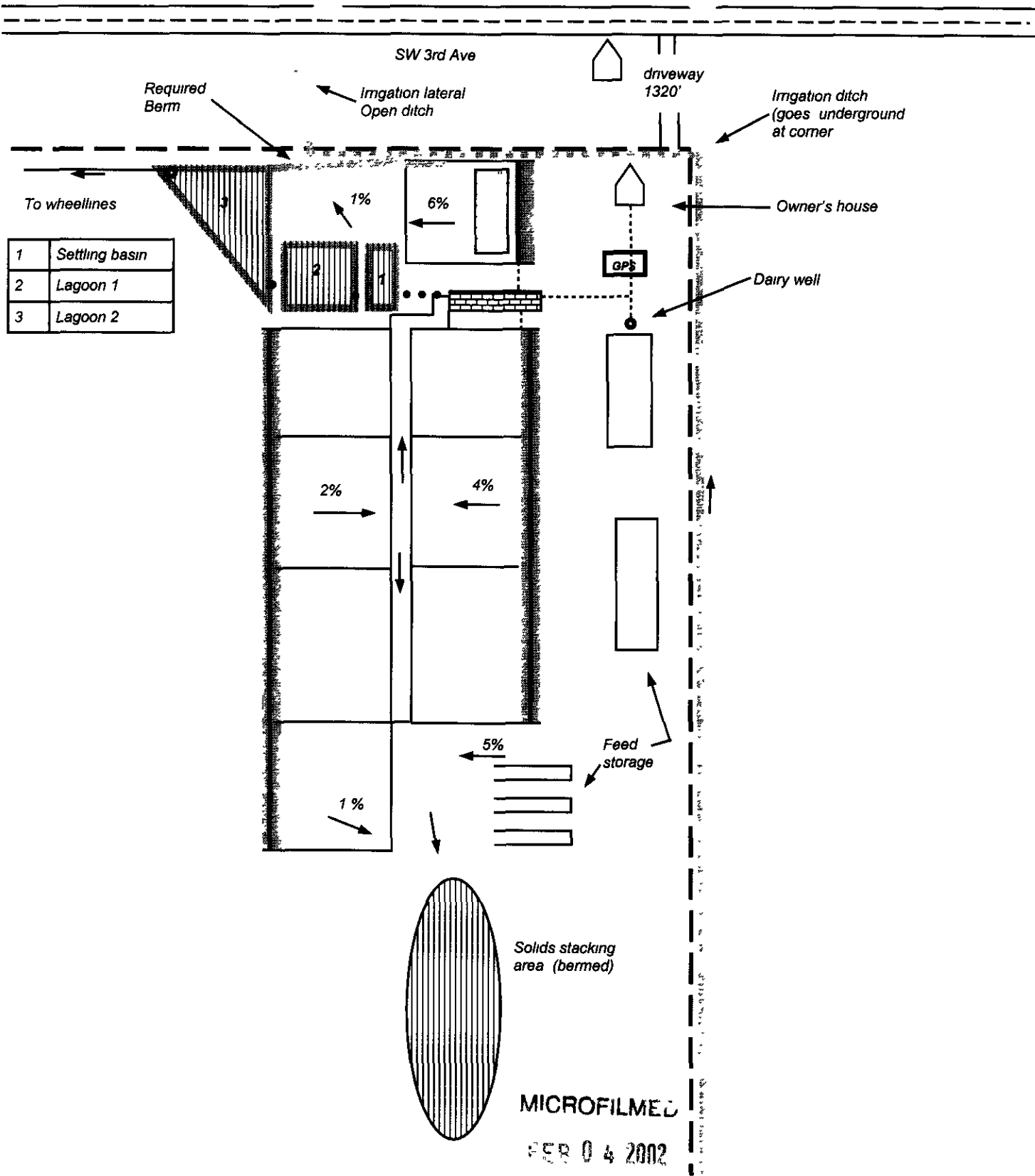
The Teunissen Dairy is located in the hydrologic unit code 17050122 in the Southwest watershed basin. The run-off goes to the Payette River stream segment (2689). The Payette River stream segment is water quality limited. The pollutants of concern are bacteria, nutrients, and temperature. The facility is found at N43° 56' 95" W116° 50' 55" using GPS co-ordinates.

The default resource concern on the Teunissen Dairy is groundwater quality. Depth to groundwater is greater than 5' on all the property. The dairy uses sprinklers for irrigation and the distribution of effluent, and run-off is unlikely in a normal rainfall year. While leaching of nutrients into groundwater is the primary risk, care must be exercised when irrigating and storing manure to avoid run-off into tributaries of the Payette River. The surface drain running through fields 2 and 3 poses a particular risk, and water or effluent applications should be done carefully to avoid run-off in that area. In addition, excessive land applications of animal waste will also elevate soil potassium and salt concentrations which will reduce crop yields.

Facility Site Plan

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Site Plan		
Frank Teunissen	Scale 1" = 263'	
3749 SW 3rd		Prepared by
New Plymouth, ID 83655		Darwin Vander Stelt



Waste Storage and Handling Requirements

- Store, handle and mix nutrient products away from wells and other water sources. Keep manure and livestock wastes at least 100 ft away from wells to prevent problems with direct run-in.
- Build a berm between the corrals on the north end of the dairy and the lagoon so as to contain any run-off to the surface drain. This is a requirement of the plan and must be done by 10/1/2001.

Nutrient Management Plan Requirements

- Liquid wastes will be applied as appropriate to all fields through the irrigation system. Total acreage currently available for land application of liquid wastes is acres. While the plan requires only a total of acres for land disposal of liquid wastes, the availability of additional acreage allows for greater flexibility in meeting the requirements of the crop rotation. Liquid waste should be applied to growing crops, at appropriate times, until the lagoon is empty.
- The lagoon will be emptied during the growing season, starting with the first irrigation and ending with the last irrigation with no effluent application through the winter season, except that effluent may be applied to growing winter crops provided there is no run-off. **Effluent must not be applied to bare ground before 1-March without consulting the Idaho Department of Agriculture.**
- Irrigation times should be adjusted so that each field receives uniform coverage with nutrients. The lagoon should never be full in the fall.
- Apply liquid waste at a rate that is consistent with the infiltration rate and available water holding capacity of the soil. Avoid applying liquids at a rate that will bring the soil to its maximum available water holding capacity. This will prevent run-off and groundwater contamination.
- Solid wastes will be applied in the spring or fall, at agronomic rates (after accounting for planned liquid waste applications), to land going into a non-legume crop. Land applied manure will be incorporated through plowing or disking as soon as possible after spreading. **Eighty-nine Percent** the solid waste will be exported off of the facility.
- For each field, keep a record of the date, time, and rate of manure or chemical fertilizer applications.
- Manure application rates developed in appendix D are based on 1.5x Crop Uptake and are approximately as follows. This table is only a rough indicator of the application rates and must be adjusted after spring soil samples are available and budgets for each field can be prepared.

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Application Schedule Field 3		Nutrients provided in current year by this application				
Year	Field	Liquid (%lagoon)	Solids (CF/ac)	N	P	K
2001	3	38%	752	106	52	220
2002	3	38%	0	66	52	220
2003	3	38%	752	106	52	220
2004	3	38%	0	66	52	220
2005	3	38%	752	106	52	220
Application Schedule Field 1,2, 4- 6		Nutrients provided in current year by this application				
Year	Field	Liquid (%lagoon)	Solids (CF/ac)	N	P	K
2001	1		2652	217	93	414
2001	5	63%		52	22	87
2002	1		2652	222	102	452
2002	5	63%		52	22	87
2003	5	63%	1326	191	71	305
2004	4		2652	217	93	414
2004	5	63%	1326	163	73	313
2005	4		2652	222	102	452
2005	2		2652	217	93	414
2005	5	63%		98	30	118

- Annual Spring soil tests must be taken to ascertain the nitrogen and potassium requirements of each crop

Facility Testing Requirements

- Regulatory soil samples will be required from each field every three years. These samples must be taken from the 18-24" level for groundwater concern fields. The samples will be reviewed for phosphorus level and compared with previous test data. These tests will indicate compliance with the nutrient management plan and the adequacy of the plan. Regulatory soil testing will be conducted every three years starting in 2001.

Storage and Handling Plan Recommendations

- Weed control along the top and inside surface of the lagoon will help control plugging problems associated with pumping lagoon water through sprinklers.
- Apply liquid wastes during daylight hours so that set times can be adjusted and run-off avoided.

A list of recommended practices relating to the storage and handling of manure is as follows (from "BEST MANAGEMENT PRACTICES for Nutrient Management in the State of Idaho")

ODOR CONTROL

- Maintain a distance from the facility to any occupied residence. When considering where to place corrals, lagoon, etc., one should take into consideration the prevailing wind direction and frequency, land topography, number of animal units, the size of structure (i.e. lagoon, etc.), and manure management practices in relationship to nearby residences.
- General housekeeping around the facility, such as gathering feed spillage around feed bunks, proper carcass disposal, and keeping manure accumulation to a minimum will assist in reducing odor.

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- Using inoculants (bacteria, etc) in lagoons can reduce the amount of solid manure in the lagoon and reduce odor
- Manure storage management - cleaning solids, settling basins, and channels on a regular basis can have a significant effect on odor
- Through the use of aeration devices, the intensity of odor coming off of a lagoon structure can be significantly reduced. Some typical aeration devices that are being used are windmill aerators, aeration pumps, and recirculatory systems where water is pumped from the bottom of the lagoon and injected onto the surface of the lagoon
- Creating windbreaks through the use of structural and natural barriers around the facility can reduce the degree and distance of odor dispersal. Using a windbreak along the prevailing wind side of a lagoon can increase the velocity of the wind crossing the surface of the lagoon and decrease the odor through dilution
- Artificial or bedcovers are an excellent method of reducing containment system odors. These methods can also be used in conjunction with methane harvesting systems

WASTE HANDLING

- Store, handle and mix nutrient products away from wells and other water sources
- Keep manure and livestock wastes at least 100 ft away from wells to prevent problems with direct run-in
- Berm corrals to prevent run-off of manure from the facility
- Contain manure storage areas to prevent run-off and direct seepage to groundwater from occurring
- When composting manure, try to maintain temperatures between 130 to 160°F through turning of windrows and the addition of moisture to achieve maximum composting capabilities
- Continual inspection and maintenance of waste handling facilities and equipment will prevent unwarranted waste discharges into surface water and groundwater

Nutrient Management Plan Recommendations

- Set realistic crop yield goals in order to provide an accurate account of the plant nutrient needs
- Weigh crops so that accurate yield data can be acquired
- Test hay, silage, manure, and lagoon water for concentrations of N, P, and K. Use this data to fine tune the actual crop uptakes
- Apply fertilizer to cool season crops in the spring rather than the previous fall. This will prevent fertilizer leaching through the soil profile and provide the crop with the necessary levels of nutrients
- Use split or multiple fertilizer applications in order to provide the crop with a propellant treatment and the needed nutrient levels throughout the growing season till the point of major nutrient uptake.

A list of recommended practices relating to nutrient management and spreading manure is as follows (from *"BEST MANAGEMENT PRACTICES for Nutrient Management in the State of Idaho"*)

WASTE APPLICATION

- Check with local city and county officials for applicable regulations on zoning, health, building codes, setback distances, etc
- Calibrate the manure spreader and apply only as much manure as the nutrient requirements of the crop. Incorporate the manure as soon as possible after application, to prevent runoff and conserve nitrogen

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- Test the soil in each field for N, P, K, and other nutrient levels, pH, and cation exchange capacity. Follow a soil testing routine recommended by the Cooperative Extension Service or by a crop consultant or fertilizer dealer.
- On each field, keep a record of manure and chemical fertilizer applications, crop information, and soil and manure test results.
- Create buffer zones or filter strips around environmentally sensitive areas, such as rock outcroppings, surface waters, etc., to prevent surface water and groundwater contamination.
- To prevent excessive P and K buildup, rotate manure applications to other fields, or decrease applications to meet the most limiting nutrient requirement (generally P) and then supplement with commercial fertilizer.
- Be cautious applying waste to areas of high soil permeability with high leaching potential and areas of low soil permeability (>50% clay) since they do not provide sufficient infiltration.
- Refrain from manure application near residences, roadways, etc. to decrease risk of incidental contamination and odor problems.
- Apply liquid waste at a rate that is consistent with the infiltration rate and available water holding capacity of the soil. Avoid applying liquids at a rate that will bring the soil to its maximum available water holding capacity. This will prevent run-off and groundwater contamination.
- Manure application to frozen ground should be limited to fields with slopes less than 6%. These minimal slopes will be less likely to have a major run-off due to a storm event.
- If manure is applied in a 10-yr floodplain area, it should be incorporated within 72 hrs of application.
- In the spring or fall, apply manure with the greatest N content, in the summer, apply that with the least N content.
- Haul the highest nutrient content manure to the farthest fields. Apply the lowest nutrient content manure to the closest fields. Irrigate with runoff water and lagoon water.
- Apply the highest nutrient manure to corn silage, vegetable root crops, or other crops with high nutrient demands.
- Apply the highest nutrient manure to legumes only if you have no better use for the N, for legumes can produce their own N if none is provided.
- To avoid N leaching to ground water, limit N applications on sandy soils, and avoid soils with high water tables.

NITROGEN MANAGEMENT

- When applying manure in the fall and winter, it is recommended that it not be applied when soil temperatures are greater than 50° F. At lower temperatures, the conversion of ammonium-N to nitrate-N is significantly reduced.
- Nitrification inhibitors in liquid-manure injection systems can decrease N losses in coarse-textured soils all year long, in all soils during fall and summer, and in fine or medium textured soils with high water tables during winter and spring.
- Apply N so that it is available during peak plant demand.
- To minimize nitrate leaching, apply manure to sandy soil shortly before planting time, and apply small amounts N frequently instead of a large amount at one time. Do not fall-apply on sandy soil without first completing a hydraulic loading analysis.

PHOSPHORUS MANAGEMENT

- In areas of surface water or run-off concern, berm field boundaries to prevent phosphorus from leaving the field through erosion and run-off.
- Irrigate fields efficiently to meet crop needs and the available water holding capacity of the soil. This will prevent phosphorus run-off from occurring caused by over irrigation.

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- Install and maintain properly designed buffer/filter strips to prevent phosphorus runoff and erosion
- The use of PAM is a management practice to prevent sediment attached phosphorus runoff and erosion

Irrigation Management Plan Recommendation

- Irrigate fields efficiently to meet crop needs and the available water holding capacity of the soil. This will prevent the movement of nitrogen through the soil profile to groundwater caused by over irrigation
- A soil moisture-monitoring device should be utilized to help determine irrigation scheduling to meet crop demands
- The following schedule suggests maximum irrigation frequencies for the soil types, crops, and irrigation systems on the farm:

	Days between	No. hours/	in .
Field	Irrigation	rot./ set	water
1-6	7	12	2.8

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Analysis of Nutrient Management Practices

Facility Description

The Teunissen Dairy is an existing dairy facility located in New Plymouth, Idaho at 3749 SW 3rd, and is operated by Frank Teunissen

The purpose of this nutrient management plan is to inform the producer and others of the value of animal waste and to certify that nutrients are utilized in an appropriate way which will not adversely impact surface or groundwater

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Resource Concerns

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Waste Storage and Handling

Solid waste and bedding deposited in the corrals are piled and stored in the corrals, or in the storage basin adjacent to the corrals. Approximately 15% of the total manure produced is deposited in the milking parlor and holding pen. It is estimated that 500 tons of straw are used yearly for bedding purposes. Manure will be transported from the corrals and from the storage basin in tractor drawn manure spreaders and applied to owned or rented cropland.

Manure deposited in the milking parlor flows directly into the lagoon. Solids are allowed to settle out and liquids flow by gravity into the lagoons. All runoff is contained in the lagoons. Lagoon sizing is based on owner estimates. It is estimated that 3180 gallons per day are used for cow prep and clean up, with an additional 11047 gallons per day used by the wash pen. The required storage in for 180 days is 502,631 cubic feet. **The lagoons**

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together hold a total of 551,600 cu. ft., which is more than adequate for 180 days storage. The calculations for the required 180 day storage for liquid wastes is found in Appendix C.

Table 1 shows the total quantity of nutrients produced on the facility
Table 1. Nutrients Produced

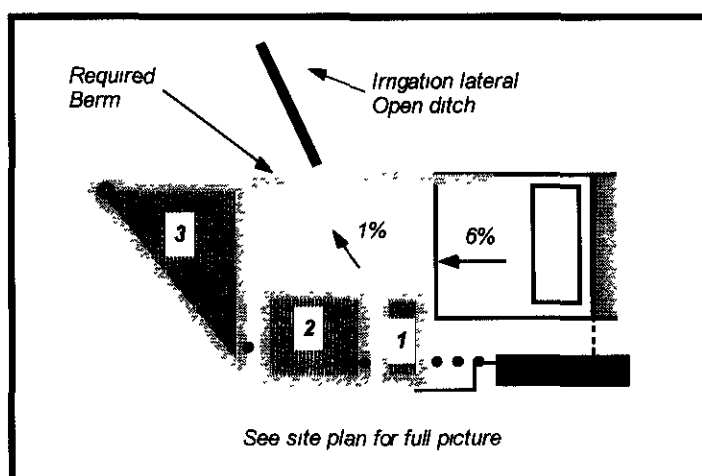
Description	Volume cu.ft	N lbs/yr	P lbs/yr	K lbs/yr	Ton@40#/cf) Gallons
Lagoon	716,275	2,980	1,288	4,783	5,372,061
Solid Waste	643,841	63,373	28,082	118,109	12,877
Total Nutrients Produced	1,360,115	66,353	29,370	122,892	
Deduct: Nutrients exported	555,765	54,704	24,240	101,952	
Total Nutrients for Land Application		11,649	5,129	20,940	

See Appendix A

Percentage of N, P, and K to be exported: 82%
 Percentage of solid waste to be exported: 86%

Raw data used to calculate the information illustrated in Table 1 is found in Appendix A. The actual tonnage of material to be applied or exported is dependent upon the degree of decomposition of the solid material, moisture levels and other factors. The producer is required to keep records, both of tonnage applied, and tonnage exported, to verify that an appropriate percentage of solid manure is exported.

The drain ditch running north of the corrals could provide a means for transporting run-off to the Payette River and should be bermed to prevent this possibility. The berm should be connected to the embankment of the lagoon, and should run as far east along the edge of the corral as is necessary to prevent any accidental run-off.



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A list of recommended practices relating to the storage and handling of manure is as follows (from "BEST MANAGEMENT PRACTICES for Nutrient Management in the State of Idaho")

ODOR CONTROL

- Maintain a distance from the facility to any occupied residence. When considering where to place corrals, lagoon, etc., one should take into consideration the prevailing wind direction and frequency, land topography, number of animal units, the size of structure (i.e. lagoon, etc.), and manure management practices in relationship to nearby residences.
- General housekeeping around the facility, such as gathering feed spillage around feed bunks, proper carcass disposal, and keeping manure accumulation to a minimum will assist in reducing odor.
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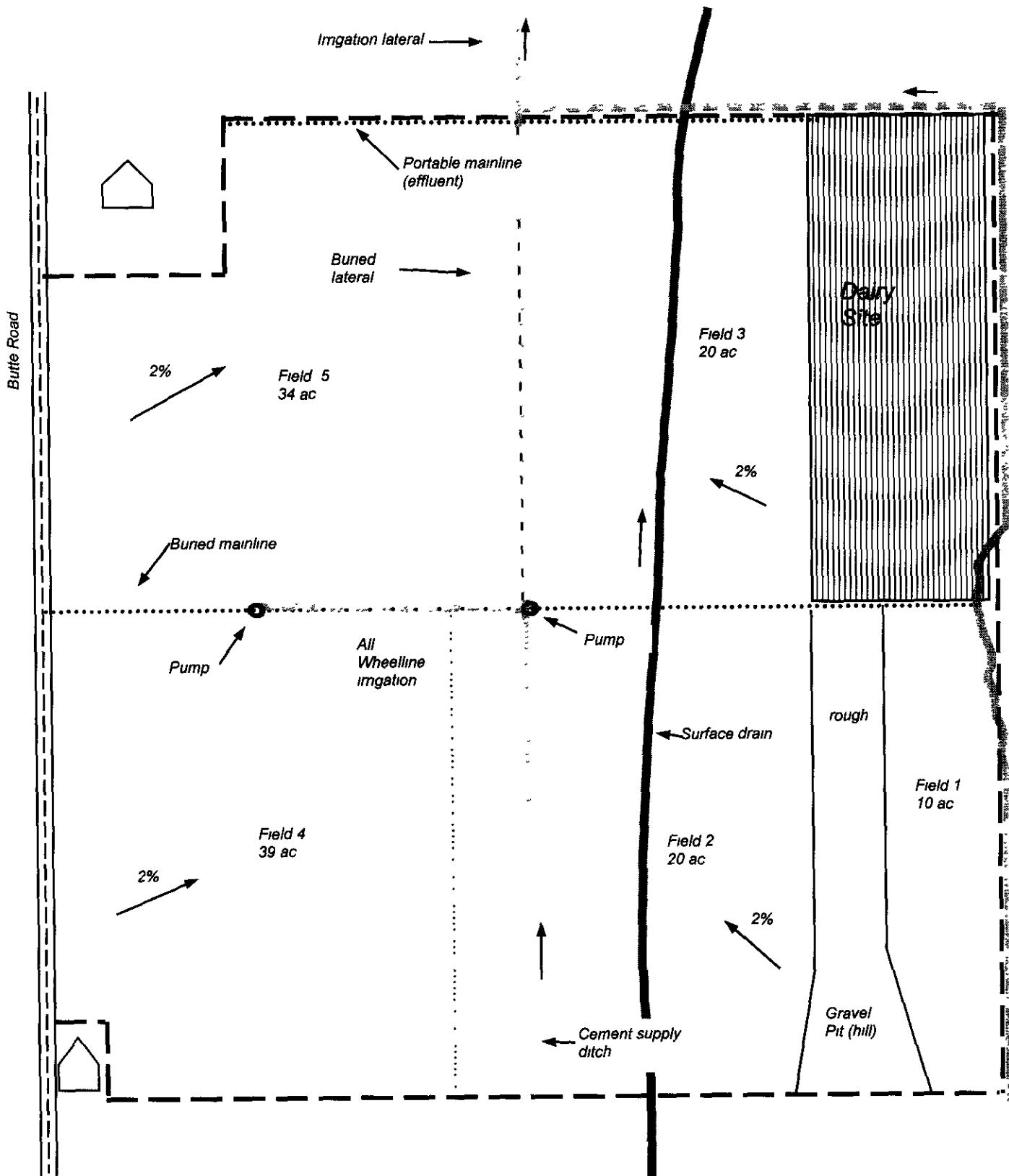
WASTE HANDLING

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- When composting manure, try to maintain temperatures between 130 to 160°F through turning of windrows and the addition of moisture to achieve maximum composting capabilities.
- Continual inspection and maintenance of waste handling facilities and equipment will prevent unwarranted waste discharges into surface water and groundwater.

Land Application Site Plan

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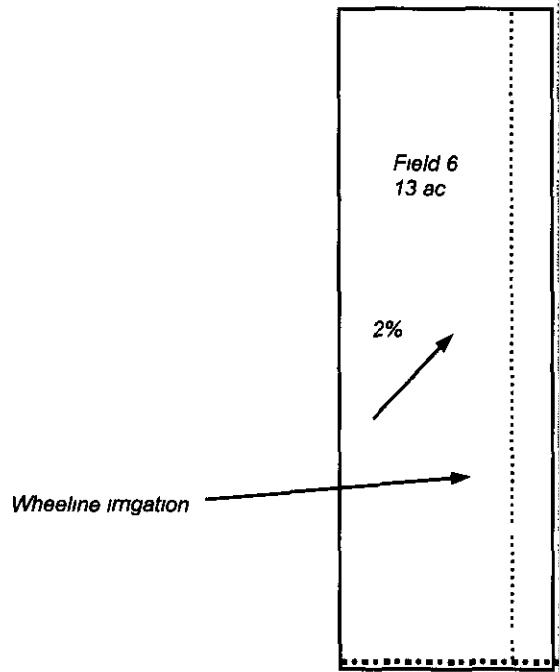


Field Application Map		
Frank Teunissen	Scale 1" = 385	
3749 SW 3rd	MICROFILMED	Prepared by
New Plymouth, ID 83655	FEB 04 2002	Darwin Vander Stelt



Rented Field (6)

Adjoins field 4



Field Application Map		
Frank Teunissen	Scale 1" = 385'	
3749 SW 3rd	SEP 04 2002	Prepared by
New Plymouth, ID 83655		Darwin Vander Stelt



Nutrient Management System

The dairy has a total of 136 acres of irrigated cropland for disposal of solid and liquid wastes

Table 2 contains an inventory of the cropland

Field	Acres	2001 Crop	Yield	Yr. in Rotation	Resource Concern
1	10	Sudan gras	25	1	Groundwater>5'
2	20	Alfalfa Hay	7	3	Groundwater>5'
3	20	Mattua bro	25	1	Groundwater>5'
4	39	Alfalfa Hay	7	4	Groundwater>5'
5	34	Alfalfa Hay	7	5	Groundwater>5'
6	13	Alfalfa Hay	7	3	Groundwater>5'

Application of all the lagoon effluent is the first priority, with applications of solid manure in amounts dependent upon the specific crop. This necessitates budgeting varying amounts of liquid and solid waste depending on acres available for emptying the lagoon. Because there is not a great surplus of land available to spread effluent, care must be exercised to leave room in the "nutrient bank" for next year's effluent. Testing of actual quantities of phosphorous in the manure and lagoon water are recommended, and regular soil testing is required.

The operator intends to grow sudan and alfalfa in rotation or Mattua bromegrass, however, it should be understood that the farmer is not bound to any particular crop selection by this plan. Nevertheless, it is required that annual nutrient budgets be prepared which take into account the manure application history, the crop production history, and the nutrient requirements for the current crop for each field.

The crop rotations, yields, and fertilization rates are shown in Table 3

Table 3. Recommended Crop Rotation, Nutrient Uptake, and Fertilization

Rotation 1		Years in Rotation	Yield (tons/acre)	N (U of I) lbs/acre	P (uptake) lbs/acre	P (1.5 x CU) lbs/acre	K(U of I) lbs/acre
Sudan grass		2	25	250 0	20 0	30	201
Alfalfa Hay		4	7	267 8	28 6	43	202
Totals		6			26	39	
Rotation 2		Years in Rotation	Yield (tons/acre)	N (U of I) lbs/acre	P (uptake) lbs/acre	P (1.5 x CU) lbs/acre	K(U of I) lbs/acre
Mattua bromegrass		5	25	250 0	26.3	39	201
Totals		6			22	33	
Uniform Rate	Acres			N (U of I)	P (uptake)	P (1.5 x CU)	K(U of I)
Rotation 1	116				26	39	
Rotation 2	20				22	33	
Average Rate	136				25	38	

The rates of fertilization indicated for nitrogen and potassium are the highest possible under the University of Idaho Guidelines. They are not necessarily appropriate for any particular crop or field. It is a requirement of this plan that soil test values will be used to

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determine a recommendation for nitrogen and potassium based on the University of Idaho Fertilizer Guides.

Soil samples have not been taken but are a requirement of this plan. When the tests are taken, the results may be recorded in the chart below

Table 4. Soil Test Data										
Field	Date	Depth	N	P (ppm)	K	pH	% OM	CEC	Org	Salts
1		18-24								
2		18-24								
3		18-24								
4		18-24								
5		18-24								
6		18-24								

Table 5 illustrates the nutrients supplied by the liquids and solids when applied at rates for phosphorous. It must be understood that the University of Idaho Guidelines make recommendations based on soil test, crop, and expected yield, so that **these average rates of application are not appropriate for any particular field or crop.** They are used to provide a crude indicator of the nutrient balance for this farm.

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Table 5. Nutrient Applied to Cropland (using P application rates)			Total Lbs./acre available each year		
Rotation 1	Crop	cu.ft./ac	N lb/acre	P lb/acre	K lb/acre
Solids	Fields 1,2,4,6				
Year	Prev nut credit		60		
1	Sudan grass	2652	217	93	414
2	Sudan grass	2652	222	102	452
3	Alfalfa Hay		91	15	63
4	Alfalfa Hay		26	6	24
5	Alfalfa Hay				
Field 5 (L & S)	Prev nut credit		60		
Yr 1 liquid	Sudan grass	13234			
Yr 1 solid		2652	269	118	512
2liquid	Sudan grass	13234			
2 solid		2652	274	124	539
3 liquid	Alfalfa Hay	13234			
3 solid			144	37	150
4 liquid	Alfalfa Hay	13234			
4 solid			78	28	111
5 liquid	Alfalfa Hay	13234			
5 solid			52	22	87
6 liquid	Alfalfa Hay	13234			
6 solid			52	22	87
Rotation 2	Crop	cu ft /ac	lb/acre	lb/acre	lb/acre
Field 3 (L & S)	Prev nut credit		0		
Yr 1 liquid	Mattua bromegrass	11316			
Yr 1 solid		884	106	52	220
2liquid	Mattua bromegrass	11316			
2 solid			66	22	87
3 liquid	Mattua bromegrass	11316			
3 solid	0	0	106	52	220
4 liquid	Mattua bromegrass	11316			
4 solid			66	22	87

As shown in Table 5, waste application at this level to meet crop phosphorus demands may supply enough nitrogen for this rotation. In general, where manure is applied at phosphorus uptake levels, non-legume crops will need more nitrogen, and legume crops will need more potassium. The application rates suggested in this plan are useful as general guidelines, however, mineralization plays an important role in the availability of nitrogen and potassium. Mineralization is dependent upon temperature, precipitation, nutrient content of the manure, as well as other factors. **Because these factors cannot be managed, mineralization can and will vary considerably from one year to the next. Therefore, due to the mobility and variability in the availability of nitrogen and potassium, a spring soil test is imperative to determine the exact nutrient needs of the crop.** This is especially true when using a nutrient budget approach to optimize nutrient applications.

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Mineralization rates used to develop Table 5 are as follows

General mineralization rates for nitrogen, phosphorus, and potassium for the PNW

Nutrient and location			Percent mineralized (years after application)		
			1st Year	2nd Year	3rd Year
Nitrogen					
West of Cascades			60%	20%	15%
East of Cascades, irrigated			60%	25%	10%
East of Cascades, dryland			45%	20%	15%
Phosphorus					
West of Cascades			76%	10%	6%
East of Cascades			80%	8%	5%
Potassium					
West of Cascades			80%	8%	5%
East of Cascades			85%	8%	5%

Source: How to Calculate Manure Application Rates In the Pacific Northwest, PNW0239, University of Idaho, Oregon State University, or Washington State University

Table 6 shows the total acres that should be utilized to land apply the liquid and solid waste from 1340 AU's onto the current cropland rotation

Table 6. Acres Needed for Land Application

1.5x Crop Uptake	
Liquids	34
Solids	745

The Teunissen Dairy has 136 acres in cropland rotation, 54 of which are currently available for disposal of liquid wastes. Where fields may receive both liquid and solid waste, care must be taken to leave room in the nutrient budget for future liquid manure applications. While it is possible and acceptable to apply all the phosphorous required for 5 years in the first year, if that is done through the application of solid waste, there will be no place to go with liquid manure in the subsequent years. Manure and liquid waste should be applied according to the following schedule

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Application Schedule Field 3		Nutrients provide 0 - - -				
Year	Field	Liquid (%lagoon)	Solids (CF/ac)	N	P	K
2001	3	38%	752	106	52	220
2002	3	38%	0	66	52	220
2003	3	38%	752	106	52	220
2004	3	38%	0	66	52	220
2005	3	38%	752	106	52	220
Application Schedule Field 1,2,		Nutrients provided in current year by this application				
Year	Field	Liquid (%lagoon)	Solids (CF/ac)	N	P	K
2001	1		2652	217	93	414
2001	5	63%		52	22	87
2002	1		2652	222	102	452
2002	5	63%		52	22	87
2003	5	63%	1326	191	71	305
2004	4		2652	217	93	414
2004	5	63%	1326	163	73	313
2005	4		2652	222	102	452
2005	2		2652	217	93	414
2005	5	63%		98	30	118

In spreading the lagoon water, care should be used to distribute the applications throughout the season. Applications of lagoon water should be alternated with irrigation water or mixed with irrigation water to avoid burning crops.

Hydraulic Balance

Liquid waste may be applied to a growing crop through the irrigation system at any time of the year, **provided there is no run-off**. When applying liquid wastes to bare ground, there is an additional concern that nutrients will be leached into the ground water. Consequently, it is important to determine the date before which application to bare ground poses an unacceptable risk of groundwater contamination. The calculations which develop this date are found in Appendix F. The calculations are summarized in a chart which follows. Assuming that applications will be made in increments of 5 inches, 1-Mar is the earliest date applications may be made.

Amount of application		0.5 inch	
1/2AWHC (in)	2.6		
Semi-monthly precip			
Payette	inches	Storage available	
4/1-4/15	0.405		2 145
3/15-3/30	0.68		1 465
3/1-3/15	0.68		0 785
2/14-2/28	0.74		0 045
2/1-2/14	0.74		-0 695
1/15-1/30	0.95		-1 645
1/1-1/15	0.95		-2.595
First Date to store(inch)		0.5	1-Mar

A list of recommended practices relating to nutrient management and spreading manure is as follows (from "BEST MANAGEMENT PRACTICES for Nutrient Management in the State of Idaho")

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WASTE APPLICATION

- Check with local city and county officials for applicable regulations on zoning, health, building codes, setback distances, etc
- Calibrate the manure spreader and apply only as much manure as the nutrient requirements of the crop. Incorporate the manure as soon as possible after application, to prevent runoff and conserve nitrogen
- Test the soil in each field for N, P, K, and other nutrient levels, pH, and cation exchange capacity. Follow a soil testing routine recommended by the Cooperative Extension Service or by a crop consultant or fertilizer dealer
- On each field, keep a record of manure and chemical fertilizer applications, crop information, and soil and manure test results
- Create buffer zones or filter strips around environmentally sensitive areas, such as rock outcroppings, surface waters, etc., to prevent surface water and groundwater contamination
- To prevent excessive P and K buildup, rotate manure applications to other fields, or decrease applications to meet the most limiting nutrient requirement (generally P) and then supplement with commercial fertilizer.
- Be cautious applying waste to areas of high soil permeability with high leaching potential and areas of low soil permeability (>50% clay) since they do not provide sufficient infiltration
- Refrain from manure application near residences, roadways, etc. to decrease risk of incidental contamination and odor problems
- Apply liquid waste at a rate that is consistent with the infiltration rate and available water holding capacity of the soil. Avoid applying liquids at a rate that will bring the soil to its maximum available water holding capacity. This will prevent run-off and groundwater contamination
- Manure application to frozen ground should be limited to fields with slopes less than 6%. These minimal slopes will be less likely to have a major run-off due to a storm event
- If manure is applied in a 10-yr floodplain area, it should be incorporated within 72 hrs of application
- In the spring or fall, apply manure with the greatest N content, in the summer, apply that with the least N content
- Haul the highest nutrient content manure to the farthest fields. Apply the lowest nutrient content manure to the closest fields. Irrigate with runoff water and lagoon water
- Apply the highest nutrient manure to corn silage, vegetable root crops, or other crops with high nutrient demands
- Apply the highest nutrient manure to legumes only if you have no better use for the N, for legumes can produce their own N if none is provided
- To avoid N leaching to ground water, limit N applications on sandy soils, and avoid soils with high water tables

NITROGEN MANAGEMENT

- When applying manure in the fall and winter, it is recommended that it not be applied when soil temperatures are greater than 50° F. At lower temperatures, the conversion of ammonium-N to nitrate-N is significantly reduced
- Nitrification inhibitors in liquid-manure injection systems can decrease N losses in coarse-textured soils all year long, in all soils during fall and summer, and in fine or medium textured soils with high water-tables during winter and spring
- Apply N so that it is available during peak plant demand
- To minimize nitrate leaching, apply manure to sandy soil shortly before planting time, and apply small amounts N frequently instead of a large amount at one time. Do not fall-apply on sandy soil without first completing a hydraulic loading analysis

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PHOSPHORUS MANAGEMENT

- In areas of surface water or run-off concern, berm field boundaries to prevent phosphorus from leaving the field through erosion and run-off
- Irrigate fields efficiently to meet crop needs and the available water holding capacity of the soil. This will prevent phosphorus run-off from occurring caused by over Irrigation
- Install and maintain properly designed buffer/filter strips to prevent phosphorus runoff and erosion.
- The use of PAM is a management practice to prevent sediment attached phosphorus runoff and erosion

Crop Information

The following crop information was taken from the University of Idaho Crop Fertilization Guide. Crop guides are not available for Mattua or Sudan –sorghum, however the crop guides for irrigated winter barley and for corn should give some approximation. Barley was chosen for Mattua because of Mattuas tendency to take up whatever nitrogen is available, and corn was chosen because tonnages of sorghum sudan can approach those of corn. It should be noted however, that sorghum sudan also has the ability to take up more nitrogen via increased protein or nitrate content in the forage.

Some of the charts have been expanded to demonstrate quantities of manure which are required to replace chemical fertilizers.

Southern Idaho Fertilizer Guide

Irrigated Winter Barley

Brad Brown, Soil Scientist
Parma Research and Extension Center



The following fertilizer guidelines are based on University of Idaho research that relates the yield response of irrigated winter barley to soil test N and applied nitrogen fertilizer. Guidelines for other nutrients are extrapolated from research on other winter small grains. The suggested fertilizer rates are designed to produce above average yields if other factors of production are not limiting. Thus, these fertilizer recommendations assume good management practices and no other limitations to production.

The suggested fertilizer rates also assume that soil samples are properly taken and processed, and that they represent the area to be fertilized. Many fields have appreciable variation in residual nutrient soil test levels or productivity. Areas within fields that differ significantly in residual fertility or productivity should be sampled and treated separately if the areas are large enough that application rates can be conveniently adjusted and the fertilizers cost effectively applied. Accurate crop history information is also essential for making appropriate fertilizer recommendations.

Nitrogen (N)

Adequate N is necessary for maximum economic production of irrigated winter barley. Nitrogen is usually the greatest fertilizer expense for winter barley in Idaho. The amount of N required depends on many factors that influence irrigated winter barley production and quality. Yield potential and available N from all sources (soil test, previous crop, and mineralizable N) should be considered when determining N fertilizer rates to use.

Total N Requirements Based on Potential Yield

Fertilizer N rates should correspond to the yield growers can reasonably expect for their soil and management conditions. Historical yields for a specific field or area will generally provide a fair approximation of yield potential, given the grower's traditional crop management. Projected changes in crop management (water management, variety, lodging control, disease and weed control) designed to appreciably increase production may require adjustment of yield potential.

Research in western Idaho has shown that the available N from all sources required to produce a bushel (48 pounds) of irrigated winter barley depends on several crop management practices. Factors such as weed, insect, and disease control as well as irrigation, planting date and soil type can influence the N required for maximum yield. Results of field trials suggest that two pounds of available N per bushel are required for irrigated winter barley ranging in yield from 120 to 160 bushels per acre. Nitrogen requirements are greater than two pounds per bushel when expected yields are below 100 bushels per acre. The total N required for a range of expected yields is given in Table 1.

Table 1. Total available N requirement of winter barley based on expected yield.

Yield potential	N requirement
(bu/acre)	(lb N/acre)
80	200
100	220
120	240
140	270
160	300
180	330

Available Nitrogen

Available N in the soil includes mineralizable N (released from organic matter during the growing season), inorganic N as nitrate ($\text{NO}_3\text{-N}$) and ammonium ($\text{NH}_4\text{-N}$), and N credits from previous cropping or manures. Each component of available N must be estimated for accurate determination of optimum fertilizer N rates.

Mineralizable Nitrogen—Soils vary in their capacity to release N from organic matter during the growing season. The amount of N released depends on such factors as soil type, soil moisture, soil temperature, previous crop, and the history of fertilizer N applied.

Measurements of mineralizable N for winter cereals typically range from 30 to 60 pounds per acre. Unless the capacity of a specific soil to release N is known, use a midpoint mineralizable N value of 45 pounds N per acre for irrigated winter barley. While soil organic matter content is frequently used to estimate annual mineralizable N contributions, in southern Idaho irrigated soils organic matter does not accurately predict the amount of N that is mineralized.

Inorganic Nitrogen—Residual soil inorganic N (NO_3 , NH_4) can be evaluated most effectively with a soil test. Soil samples should be collected in foot increments to a depth of two feet, unless roots are restricted by dense soil layers or high water tables.

Ammonium N ($\text{NH}_4\text{-N}$) is generally low in preplant soil samples and thus contributes little to available N. However, it can be as high or higher than $\text{NO}_3\text{-N}$. $\text{NH}_4\text{-N}$ should be determined along with $\text{NO}_3\text{-N}$, especially when there is reason to expect the presence of appreciable $\text{NH}_4\text{-N}$, such as recent ammonium N fertilizer applications.

To convert soil test $\text{NO}_3\text{-N}$ and $\text{NH}_4\text{-N}$ values to lb N per acre, sum the N expressed in ppm for each foot increment of sampling depth and multiply times four. An example is shown in Table 2.

Table 2. Soil test N conversion example.

Depth	$\text{NO}_3\text{-N}$	$\text{NH}_4\text{-N}$	Sum	Inorganic N ¹
(inches)	(ppm)	(ppm)	(ppm)	(lb/acre)
0 to 12	13	2	15	60
12 to 24	6	2	8	32
Total	19	4	23	92

¹ppm x 4 = lb per acre

A preplant soil sample is often only collected from the first foot of soil. Although this information is not as complete and reliable as would be provided by deeper sampling, residual N measurements from the first foot of soil can be combined with estimates of residual N in the

second foot to predict N requirements for irrigated winter barley. For fall-planted winter cereals in western Idaho, preplant soil test $\text{NO}_3\text{-N}$ in the second foot of the soil is commonly only one-half to two-thirds as high as in the first foot of soil. If the residual N value is only available from the first foot of soil, estimate the $\text{NO}_3\text{-N}$ in the second foot at 50 to 67 percent of the first value and sum over the two values. However, this estimate may not be accurate after potatoes or other sprinkler irrigated crops, especially in coarser textured soils. Basing N rate recommendations on estimates of residual N in the second foot increases the risk of recommending either too little or too much N.

Nitrogen From Previous Crop Residues—Nitrogen associated with decomposition of previous crop residues should also be considered when estimating available N. Residues that require additional N for decomposition include cereal straw and mature corn stalks. Research has shown that 15 pounds of additional N are needed per ton of straw returned to the soil, up to a maximum of 50 pounds. For more information on compensating for cereal residues, refer to CIS 825, *Wheat Straw Management and Nitrogen Fertilizer Requirements*.

Row crop residues (potatoes, sugarbeets, onions) generally do not require additional N for decomposition. Consequently, these residues have little effect on the N needs of winter barley.

Legume residues from beans, peas, and alfalfa can release appreciable N during the following crop season that may not be reflected by the preplant soil test. This N is derived from the decomposition of both plant tops and nodulated root systems. Table 3 estimates the net N contribution from previous cropping.

Table 3. Estimated nitrogen credit for previous crop.

Previous crop	Nitrogen credit
	(lb N per acre)
Grain or corn (mature residue returned)	-50
Grain or corn (residue removed)	0
Sweet corn (residue returned)	0
Row crops (potatoes, sugarbeets, onions)	0
Beans and Peas	40
Alfalfa	60

Nitrogen From Manures—Soils in which winter barley is grown occasionally receive animal manures or lagoon wastes. Nutrient contributions from these sources should also be taken into consideration when estimating available N for the next season. Manures can preclude the need for any fertilizer, depending on the rate applied and their nutrient composition.

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Manures can vary appreciably depending on the animal, how the manure is processed, and the kind and extent of bedding material. For the most accurate estimate of fertilizer equivalent values, the manure should be analyzed for its nutrient content. For more detailed information on animal manures and their nutrient contributions to soils refer to PNW Bulletin 239, *How to Calculate Manure Application Rates in the Pacific Northwest*

Calculation of N Application Rates

To calculate the fertilizer N application rate, four or five values must be estimated. (1) total N needed to produce a given yield, (2) mineralized N, (3) inorganic N ($\text{NO}_3 + \text{NH}_4$) as measured by the soil test, (4) previous crop/residue management, and (5) manuring practice. A sample calculation is provided in Table 4. This example assumes an expected yield of 140 bushels per acre, 45 pounds N per acre mineralized from soil organic matter, soil test inorganic N measuring 92 pounds per acre, a previous crop of corn taken as silage, and no manures applied.

Table 4. Sample N requirement calculation.

Available N component	lb N/acre
Total N required (from Table 1)	270
Minus mineralizable N	-45
Minus inorganic N	-92
Previous crop factor (from Table 3)	0
Manures	0
N fertilizer required (sum above)	133

In research trials, irrigated winter barley required from 180 to 220 pounds per acre of fertilizer N plus soil $\text{NO}_3\text{-N}$ (measured to a depth of two feet). Maximum yield in the trials ranged from 95 to 158 bushels per acre. Significant lodging sometimes occurred at high available N levels associated with maximum yields.

Timing of Nitrogen Application

Excessive irrigation or heavy winter precipitation can result in leaching of nitrate N beyond root systems. This hazard exists on all soils, but particularly on coarse-textured soils such as sands, and sandy loams. Fall preplant N was once thought to be as good or preferable to spring topdressed N in calcareous silt loam or clay soils in areas of low rainfall. However, even under these conditions, southern Idaho research has shown that N applied in late winter or early spring is frequently used more effectively than early fall preplant applied N

Nitrogen fertilizers containing ammonium (ammonium sulfate, anhydrous or aqua ammonia, or urea) are less subject to leaching losses when lower soil temperatures (less than 40 °F) inhibit the microbial conversion of

ammonium to nitrate. Lower temperatures also reduce the microbial activity that is responsible for the immobilization of applied N. Late fall, split, or spring applied N is also recommended when residues from previous grain or mature corn crops are returned to the soil in early fall.

Nitrogen Impact on Lodging

Winter barley lacks the straw strength commonly found in irrigated winter wheat. The poor straw strength makes irrigated winter barley especially susceptible to lodging at near optimum to high available N levels. Lodging can reduce both grain yield and quality, as well as increase harvest costs. The yield response to available N is seriously limited in the event of lodging.

Varieties differ in straw strength, plant height, and their susceptibility to lodging. If lodging is a concern, use winter barley varieties that are the least susceptible to lodging. For descriptions of varieties and their susceptibility to lodging, refer to Progress Report 311, 1997 *Certified Seed Selection Guide for Public Varieties of Winter Wheat and Winter Barley*, or the most recent guide available.

Ethephon (Cerone®) is a growth regulator commonly used to shorten small grains and to stiffen straw. It can significantly reduce the incidence and severity of lodging in winter barley. Field trials in western Idaho indicated that the use of Cerone® increased yield under high N conditions from 14 to 26 bushels per acre in areas susceptible to lodging. Growers should consider using this growth regulator for soils with nearly optimum to high available N, particularly if lodging has historically been a problem in their location.

Phosphorus (P)

Phosphorus deficient winter barley appears stunted but may not otherwise exhibit obvious symptoms. Winter barley grown in rotation with P fertilized crops such as potatoes, onions, or sugarbeets will often not need additional fertilizer P.

Although winter barley requires little phosphorus compared to other crops, minimum soil levels are necessary for maximum production. Winter barley is less cold tolerant than winter wheat and adequate P is necessary for winter hardiness.

Soil tests can indicate whether soils require P fertilization for maximum winter barley production. Soil samples are collected from the first foot of soil before planting. Lime content of soil interacts with fertilizer P to reduce its effectiveness. Fertilizer P rates should be increased as soil lime increases. Table 5 gives phosphorus fertilizer rates based on the soil test P level and lime content.

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Table 5. Recommended phosphorus fertilizer rates (lb P₂O₅ per acre)¹ based on soil test P and lime content.

Soil test P ² 0 to 12 inches (ppm)	Lime content ³ (%)			
	0	5	10	15
	(lb P ₂ O ₅ per acre)			
0	160	200	240	280
5	100	140	180	220
10	40	80	120	160
15	0	20	60	100
20	0	0	0	40
25	0	0	0	0

¹To convert P from the oxide (P₂O₅) to the elemental form (P), multiply by 0.43.

²NaHCO₃ extraction (sodium bicarbonate)

³Lime content is measured as calcium carbonate equivalent.

Effective methods of application include broadcast-ing at plowdown, broadcasting and incorporating during seedbed preparation, or drill banding low rates of P with the seed. Drill banding may reduce the amount of fertil-izer required. Drill banding high rates of P with the seed, especially ammonium phosphate fertilizers, can cause seedling damage. For more detailed discussion of band-ing, refer to PNW 283, *Fertilizer Band Location for Cereal Root Access*.

Potassium (K)

Winter barley has a lower requirement for K than sugarbeets, corn, or potatoes. Potassium deficiency in southern Idaho winter barley is relatively rare compared to N and P deficiency. Application of K should not be necessary if winter barley is rotated with other annual crops that receive fertilizer K.

Soil test K can be a useful indicator of the need for K. Table 6 gives K rates based on the K soil test. Fertilizer K should be plowed down or incorporated during seed-bed preparation

Table 6. Recommended potassium fertilizer rates (lb K₂O per acre) for winter barley based on soil test K.

K soil test ¹ 0 to 12 inches (ppm)	Potassium rates (lb K ₂ O per acre) ²
25	160
50	80
75	0

¹NaHCO₃ extraction.

²To convert from the oxide (K₂O) to the elemental form (K) multiply by 0.84

Sulfur (S)

Sulfur requirements for winter barley will vary by soil texture, previously incorporated crop residues, leaching losses, S content of the irrigation water, and the S soil test. The S soil test in the first foot of soil is less reliable than soil tests for other macronutrients.

Sulfur in the first foot of soil is easily leached to lower depths but, unlike other mobile nutrients such as NO₃-N, it may precipitate with calcium to form gypsum. Precipitated gypsum prevents further leaching of S and serves as a reservoir of S for deeper winter barley roots. Conse- quently, soils should be tested for S to a depth of two feet, similar to N

Accordingly, soil that tests low in S near the surface (less than 8 ppm SO₄-S in the first foot of soil) may be temporarily deficient in S until root growth extends deeper into the profile. Severe S shortages early in the season can reduce tillering and limit yield. Severe short- ages are indicated by the yellowing of new leaves while older lower leaves retain their green color. Under the most severe conditions, upper leaves may actually be- come white. Normally, barley will withstand the less severe shortages with little if any yield loss. If preplant soil test S is low to a depth of two feet, 20 to 40 lb of S per acre should be applied.

In many areas, the S content of the irrigation water is high enough to satisfy the S requirements of winter barley. Winter barley irrigated with Snake River water or waters consisting of significant runoff from other fields should not experience S shortages.

Plant analysis can be useful in confirming a sulfur deficiency. The ratio of N to S in whole plants should not exceed 17:1. Ratios above 17:1 indicate a shortage of S

Most sources of preplant applied S are effective in supplying S to winter barley. To address S shortages with spring topdressings, use fertilizers containing readily available S such as gypsum

Micronutrients (Fe, Mn, Zn, Cu, B)

Winter barley growth response to micronutrients has generally not been observed in irrigated southern Idaho soils. Even in severely scraped or eroded soils, other nutrients tend to be more limiting to yield than micronu- trients. Applications of micronutrients are generally not recommended unless need is indicated by a reliable soil or plant tissue test.

Irrigated Field Corn for Silage or Grain

The following fertilizer guidelines are based on relationships established between University of Idaho soil tests and crop yield response. The fertilizer rates suggested are designed to produce the yields shown if other factors are not limiting production. The rates will be accurate for your field provided (1) the soil sample are properly taken and represent the area to be fertilized, (2) the crop history information supplied is complete and accurate; (3) the yield goal is realistic, and (4) good crop management practices are used.

Nitrogen (N)

Adequate N is necessary for maximum economic production of irrigated field corn used for silage or grain. Fertilizer N represents by far the largest share of the fertilizer costs for field corn in Idaho. The amount of N required depends on many factors that influence total corn production and quality. These factors include length of growing season, corn hybrid, previous crop, past fertilizer use, soil type, leaching hazard and previous manuring. Estimates of both the N available to corn during the season and the yield potential of the crop should be considered when determining N fertilizer rates. may be justified if the effective rooting depth extends below 2 feet.

Potential Yield -- Fertilizer N rates should reflect the corn yield growers can reasonably expect under their soil and management conditions. The historic yield obtained in a specific field or area provides a fair approximation of yield potential given a grower's traditional crop management. Projected changes in crop management designed to appreciably alter production may require upward or downward adjustment of yield potential.

Fertilizer N Requirement -- The fertilizer N requirements for field corn silage or grain based on soil test N and potential yield are shown in Tables 1 and 2. The N requirements for grain are 10 to 15 pounds per acre higher than those for silage. Grain yield is more susceptible to N shortages than silage yield. The fertilizer N requirements are based solely on soil test N and yield potential and do not reflect differences among soils in their organic N release rates.

The recommended fertilizer N rates do not account for N cycling as influenced by previous crops. Add 20 pounds N per acre for each ton of straw or stover plowed under to a maximum of 50 pounds per acre. Straw yields are normally 3 to 4 tons per acre and are not always related to grain yields. Winter wheat generally produces more straw than spring wheat or barley. Fertilizer N rates should be reduced 60 pounds per acre when corn follows alfalfa.

Table 1. Recommended fertilizer N rates (lb/acre) for field corn harvested for silage as affected by yield level and soil test N.

Soil Test N (ppm)*	Silage yields (tons/acre)				
	20	25	30	35	40
	lb N/acre				
0	210	230	250	270	295
10	170	190	210	230	255
20	130	150	170	190	215
30	90	110	130	150	175
40	50	70	90	110	135
50	10	30	50	70	95
60	0	0	10	30	55
70	0	0	0	0	15

*Soil test N values summed for the 0 to 12 and 12 to 24 inch depths

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Table 2. Recommended fertilizer N rates (lb/acre) for field corn harvested for grain as affected by yield level and soil test N.

Soil Test N (ppm)*	Grain yields (bu/acre)						
	100	125	150	175	200	225	250
	-----lb N/acre-----						
0	215	235	255	280	300	320	340
10	175	195	215	240	260	280	300
20	135	155	175	200	220	240	260
30	95	115	135	160	180	200	220
40	55	75	95	120	140	160	180
50	15	35	55	80	100	120	140
60	0	0	15	40	60	80	100
70	0	0	0	0	20	40	60

*Soil test N values summed for the 0 to 12 and 12 to 24 inch depths

Timing N Applications -- Coarse textured soils, including sandy loams, loamy soils and sands, may lose N from leaching. For these soils, sidedress a portion of the N at the time of the last cultivation. Sprinkler irrigation of corn under center pivots provides increased flexibility for providing N during the season. With sprinklers N can be injected into the system and applied with the water. On silt loam soils, split applications of N have not proven more effective as long as preplant N is adequately incorporated.

High N rates (approaching 300 pounds per acre) broadcast and incorporated before planting may reduce early season corn growth. If high N rates are needed, split applications should be considered.

Phosphorus (P)

Adequate P is necessary for maximum production of field corn. The soil test for P is based on samples collected from the first foot of soil. The soil is extracted with sodium bicarbonate.

Table 3. Fertilizer P rates (lb/acre) based on soil test P and lime content

Soil Test P (ppm)*	Phosphate fertilizer Lime Content			Elemental P (from manure) Lime Content		
	5	10	15	5	10	15
	-----lb P ₂ O ₅ /acre-----			-----lb P/acre-----		
0	180	240	300	79	106	132
5	100	160	220	44	70	97
10	20	80	140	9	35	62
15	0	0	60	0	0	26
20	0	0	0	0	0	0

Economic response to fertilizer P is more likely with cooler soil temperatures and soils with high lime content, particularly when planting long season hybrids. Fertilizer P rates based on soil test P and soil lime contents are given in Table 3. Phosphorus is an immobile nutrient that does not move appreciably from where it is placed. It should be mixed into the seedbed or banded within easy reach of the seedling roots before or during the planting operation.

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Potassium (K)

Field corn requires adequate K for optimum growth. Soil test K can be useful in determining the need for K fertilizers. The soil sample is taken from the first foot of soil and extracted with sodium bicarbonate. Fertilizer K rates based on soil test K are given in Table 4. Sulfur (S)

**Table 4. Fertilizer K rates (lb/acre)
based on soil test K**

Soil Test P	Fertilizer K (K ₂ O)	Elemental K (from manure)
(ppm)*	-----lb K ₂ O/acre-----	-----lb K/acre-----
0	240	199
50	160	133
100	80	66
150	0	0

The major corn-growing regions of Idaho should not experience shortages of S. Areas with S deficiencies include some irrigated areas where both the soil and irrigation water are low in S. Snake River water is known to have high S concentrations. Coarse-textured soils including sandy loams, loamy sands and sands would be more susceptible to S deficiencies than silt loam soils. Where the need for S is evident, use 30 pounds per acre of sulfate-sulfur (SO₄S).

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Irrigated Alfalfa

The following fertilizer guidelines are based on relationships established between University of Idaho soil tests and crop yield response. The fertilizer rates suggested are based on research results and are designed to produce above-average yields if other factors are not limiting production. Thus, the fertilizer guide assumes use of good crop management practices.

The suggested fertilizer rates will be accurate for your field provided (1) the soil samples represent the area to be fertilized and (2) the crop history information supplied is complete and accurate.

Nitrogen

Nitrogen (N) fertilizer is generally not needed for alfalfa since a healthy alfalfa stand is capable of fixing adequate levels of N. Responses to applied N usually indicate the alfalfa stand is not effectively nodulated due to lack of proper seed inoculation at planting or that the stand is aging.

Soils containing 20 to 30 pounds (4 to 7.5 ppm) of nitrate-nitrogen ($\text{NO}_3\text{-N}$) in the top 12 inches have sufficient N to establish a stand of alfalfa seeded alone. Adding fertilizer N at establishment reduces nodule number and nodule activity.

Establishing alfalfa with a companion crop is not recommended because the alfalfa stand typically is reduced by the excessive competition from the companion plantings. When growers plant alfalfa with a companion crop, both crops compete for the N. Under these conditions, N rates of 30 to 40 pounds per acre are suggested to establish alfalfa stands.

Phosphorus

Alfalfa responds well to applied phosphorus (P). The need for P fertilization can be determined by a soil test. Phosphorus materials should be broadcast and incorporated into the seedbed before planting.

For best results, P fertilizers should be applied on established stands in the fall. Rates of P relative to soil test levels are given in Table 1. The recommended application should be sufficient for 2 years of production.

Table 1. Phosphorus Fertilizer rates based on a soil test

Soil Test P	Phosphate fertilizer	Elemental P (from manure)
(ppm)*	lb P_2O_5 /acre	lbs P per acre
0	160	70
3	120	53
7	60	26
>10	0	0

P test by NaHCO_3 Extraction

Potassium

Alfalfa has a high potassium (K) requirement. Recommended K fertilization levels are determined by soil test (Table 2). Broadcast and incorporate K at establishment or apply in the fall or early spring on established stands.

Table 2. Potassium Fertilizer needs based on a soil test

Soil Test P	Potassium fertilizer	Elemental K (from manure)
(ppm)*	lb K_2O /acre	lbs K per acre
0	240	199
56	160	133
112	80	66
150	0	0

K test by NaHCO_3 Extraction

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Sulfur

Mountain valleys and foothill areas that receive higher amounts of precipitation and/or that are irrigated with low sulfur-containing water are likely areas for sulfur (S) deficiency. Areas irrigated with water from the Snake River or any water containing the sulfate (SO_4) form of sulfur should have an adequate amount of S.

Alfalfa and other legumes require more S than grasses. Plant tissue testing is an excellent tool for detecting S-deficient alfalfa. Samples should be analyzed for total N and total S. These values are used to calculate the nitrogen/sulfur ratio, which should be less than 15. When the ratio is greater than 15, an S deficiency is suspected.

Soils testing less than 8 ppm $\text{SO}_4\text{-S}$ for 0- to 12-inch soil depth should receive 40 pounds S per acre. This rate of application should provide adequate sulfur for 2 years of production. Many southern Idaho soils contain accumulated S below the 12-inch depth. Although the 0- to 12-inch soil zone may be low in S (8 ppm), the soil below 12 inches may supply enough S for alfalfa production. Thus, testing the soil at both 0- to 12- and 12- to 24-inch depths is advised for a good S recommendation.

Fertilizer S sources include gypsum (CaSO_4) and elemental sulfur. S is also included in some N, P and K fertilizer materials. Elemental S must be biologically converted to the SO_4 form to be used by the plant. The rate of conversion depends on soil temperature, soil water content and particle size of the elemental S applied. To correct an S deficiency the year of application, use a fertilizer containing SO_4 as the readily available S source. Elemental S can be used to provide long term S release.

Micronutrients

Zinc (Zn) deficiencies on alfalfa have not been observed in Idaho. Crops such as beans, corn, potatoes and onions would normally exhibit Zn deficiency before alfalfa. Zinc applied to any of those crops would have sufficient residual for alfalfa.

Boron

Alfalfa is sensitive to low soil boron (B). B deficiencies have been observed in southern Idaho, but they are not widespread. B deficiencies normally occur on acidic soils (pH less than 7.0) and droughty (gravelly and sandy) soils. If the soil tests less than 0.25 ppm B, apply 1 to 3 pounds per acre of B. Do not use higher rates because B in excessive amounts is toxic to plants.

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Nutrient Budgeting

The following section will be utilized in conjunction with the Nutrient Budget worksheets, which are available in Appendix E to help determine fertilization rates.

The top half of the sheet is used to determine crop requirements for N, P, and K. Because this plan is based on rates of phosphorus, phosphorus recommendations from the University of Idaho fertilizer guides are used.

Line 1- Crop nutrient (N and K) requirements can be determined from spring soil testing and the University of Idaho Crop Fertilization Guides. Use the back side of the sheet to calculate these. For additional information on how to soil test, see University of Idaho Bulletin 704 - Soil Sampling (Appendix H).

Line 2- Credit N and K from irrigation water if either exceeds 5 ppm.

Line 3 - Using the U of I Fertilizer Guide, credit nitrogen from previous legume crop.

Line 4 - Total each column to arrive at nutrients required by the crop.

Line 5 - Nutrients provided by solid waste. Use appendix D for the specific field and crop.

Line 6- Nutrients provided by liquid waste. Use appendix D for the specific field and crop.

Line 7 - Subtotal the nutrients provided by animal waste (line 5 + line 6).

Line 8 - Units of each nutrient in excess or deficit. Excess phosphorus is expected in the first 4 years of the rotation.

Line 9 - Nutrients to be provided by chemical fertilizer.

This budgeting approach will help the producer to determine the amount of commercial fertilizer that should be applied to the cropland.

A list of recommended practices relating to Nutrient Budgeting is as follows: (from "BEST MANAGEMENT PRACTICES for Nutrient Management in the State of Idaho")

NITROGEN MANAGEMENT

- Set realistic crop yield goals in order to provide an accurate account of the plant nitrogen needs.
- Soil Sampling - Take representative samples of the field 34 weeks before planting. When taken at the rooting depth of the crop, these samples provide an accurate account of the plant available nitrogen already existing in the soil profile.
- Nitrogen Credits for Legumes and Manure - Crediting nitrogen supplied by legumes and manure can substantially reduce over application of nitrogen and reduce fertilizer application rates.

PHOSPHORUS MANAGEMENT

- Set realistic crop yield goals in order to provide an accurate account of plant phosphorus needs.
- Soil Sampling - Take representative samples of the field 34 weeks before planting. When taken at the rooting depth of the crop, these samples provide an accurate account of the plant available phosphorus already existing in the soil profile.

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Irrigation System

A summary of the soil types and textures found on the farm, and the water holding capacity of these soils is summarized in Table 7.

Table 7. Field Irrigation Information							
Field	texture	AWHC in./in.	Soil Depth (in)	Irrig. System	Runoff?	Drained?	WT?
1	Power-Elijah silt loam	0.20	48	Gravity	N	N	N
2	Power-Elijah silt loam	0.20	48	Handline	N	N	N
3	Power-Elijah silt loam	0.20	48	Handline	N	N	N
4	Power-Elijah silt loam	0.20	48	Handline	N	N	N
5	Power-Elijah silt loam	0.20	48	Handline	N	N	N
6	Power-Elijah silt loam	0.20	48	Gravity	N	N	N

*AWHC = Average water holding capacity in inches of water per inch of soil

** Water Table

source : Soil survey of Payette County Area

The crops grown on these fields use water at the following rates

Table 8. Crop Irrigation Information					
Crop	Table ET* mm/day	Yield Adj. %	Peak ET* in/day	oot Dept Ft	M.A.D**
Sudan	8 02	100%	0.32	3	50%
Alfalfa Hay	7 13	100%	0.28	4	55%
Mattua bromegrass	7 99	100%	0.31	3	50%

* Evapotranspiration rate (Allen & Brockway, Payette data)

** Management Allowable Depletion (% of available soil water which may be depleted without yield or quality losses. (Introduction to Irrigation System Planning and Management, table 2.3))

Appendix F suggests times and application rates for irrigation of each field. The flows and times listed for each field are based on owner estimates. The following chart summarizes the set times and application rates.

	Days between	No. hours/	in .
Field	Irrigation	rot./ set	water
1-6	7	12	2 8

The frequencies and set times in the chart are for periods of maximum evapotranspiration (i. e. oats in June or corn in July.) Frequencies may be reduced during cooler periods or when crop is immature. Efforts should be made to keep water in the root zone of growing crops. Too frequent irrigation will result in loss of water below the root zone, and flushing of nitrates and salts into the groundwater aquifer. If the irrigation rate exceeds the permeability of the soil, there will be runoff.

A list of recommended practices relating to irrigation is as follows (from "BEST MANAGEMENT PRACTICES for Nutrient Management in the State of Idaho")

IRRIGATION SYSTEM MANAGEMENT

- Evaluate the irrigation system based on the available water holding capacity of the soil, crop growth stage, evapotranspiration, rainfall, and previous irrigation in order to determine the timing and amount of irrigation water to be applied

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- Irrigation systems should be operated so that they meet the crop needs, but apply less than the amount needed to saturate the soil profile
- Irrigate fields efficiently to meet crop needs and the available water holding capacity of the soil. This will prevent the movement of nitrogen through the soil profile to groundwater caused by over irrigation
- Utilize a soil moisture monitoring device to help determine irrigation scheduling to meet crop demands

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Appendixes

Appendix A - Nutrients Produced

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Herd Profile

1	Total Cows	719
	Milking Cows	600
	Average weight /cow	1400
	Number of 1000 lb animal units	840
	Daily manure weight/1000lb animal (NRCS Handbook, Table 4-5) (Lb)	80
	Daily manure volume/1000 lbs (cu ft /day) (Table 4-5) (cu ft /day)	1 30
2	Total Milk Cow Manure volume (cu.ft/day)	1092
	Total Milk Cow Manure weight (Lbs./day)	67,200

% Dry cows 17%
 Number of Dry Cows 119

	Number of 1000 lb animal units	167
	Daily manure weight/1000lb animal (NRCS Handbook, Table 4-5) (Lb)	82
	Daily manure volume/1000 lbs (cu ft /day) (Table 4-5) (cu.ft /day)	1 3
3	Total Dry Cow Manure volume (cu.ft/day)	217
	Total Dry Cow Manure weight (Lbs./day)	13,700

Heifers:

0 9

Expected and actual numbers:

Expected and actual numbers:			Expected	Actual	Actual Avg.	Calculated
	Age % of Herd		Number	Number	Weight	Mass (lbs)
	16-24 mo	0 38	273	246	1100	270616
	13-15 mo	0 12	86	78	800	62151
	9-12 mo	0 17	122		600	0
	5-8 mo	0 17	122		350	0
	3-4 mo	0.08	58		250	0
	0-2 mo	0 08	58		125	0
	Total heifers		719	324	Total Mass	332767

Total no. of 1000 lb animal units	333
Daily manure weight/1000lb animal (NRCS Handbook, Table 4-5) (Lb)	85
Daily manure volume/1000 lbs (cu ft /day) (Table 4-5) (cu ft /day)	1.30
Total Heifer Manure volume (cu.ft/day)	433
Total Heifer Manure weight (Lbs./day)	28,285

Total volume in cu.ft/day from all animals in herd	1742
Total weight in Lb./day from all animals in herd	109,185

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Prepared by

Darwin Vander Stelt 3/7/01 11 04 2002

Appendix A Animal Nutrients

Total Nutrients Excreted:

Source: NRCS Agricultural Waste Handbook, Table 4-5

Animals		1000# AU	Lbs. per day			Lbs. per year		
			N	P	K	N	P	K
Milk Cow	600	840	0.45	0.07	0.26	137,970	21,462	79,716
Dry cows	119	167	0.36	0.05	0.23	21,954	3,049	14,026
Heifers	324	333	0.31	0.04	0.24	37,653	4,858	29,150
Total Lbs. nutrients excreted annually						197,576	29,370	122,892

Manure nutrients are handled as either solid waste or liquid waste.

		Lbs. Per Yr			Cubic ft Solids/yr	Authority
		N	P	K		
% of Milk cows handled as liquid (lagoon)	15%	20,696	3,219	11,957	59,787	(NRCS 11-5) (NRCS 11-6) (NRCS 11-8)
less separator solids	60%	(12,417)	(1,932)	(7,174)	(35,872)	
% Dry Cows handled as liquid	0%	-	-	-	-	
less separator solids	60%	-	-	-	-	
% Heifers handled as liquid	0%	-	-	-	-	
less separator solids	60%	-	-	-	-	
Total nutrients into lagoon		8,278	1,288	4,783	23,915	
N retained in storage	50%					
N retained after application	75%					
N retained after denitrification	96%					
Total N, P, K in Lagoon water		2,980	1,288	4,783		

		Lbs. Per Yr			Cubic ft Solids/yr	Authority
		N	P	K		
% Milk Cows handled as Solid waste	85%	117,275	18,243	67,759	338,793	(NRCS 11-5) (NRCS 11-6) (NRCS 11-8)
Add Separator solids		12,417	1,932	7,174	35,872	
% Dry Cows handled as solid Waste	100%	21,954	3,049	14,026	79,278	
add Separator Solids		-	-	-	-	
% Heifers Handled as Solid waste	100%	37,653	4,858	29,150	157,898	
add Separator Solids		-	-	-	-	
Total nutrients in Solids		189,298	28,082	118,109	611,841	
N retained in storage	65%					
N retained after application	60%					
N retained after denitrification	96%					
Tons of straw used	500					
deduct: 15 Lb N/ton		-7500				
Total N, P, K in Solid Waste		63,373	28,082	118,109	611,841	

Total N, P, K for land application

66,353	29,370	122,892
--------	--------	---------

Concentration of nutrients in Solid waste and Lagoon Water:

Solid waste volume:

Total 1000 Lb Animal Units

1,340

Cu Ft Waste /day/AU

1.3

NRCS Table 4-5

Daily cu ft

1,742

Annual Cu ft

635,755

4%

deduct solids into lagoon (appendix c)

23,915

Annual Cu ft

611,841

Add Straw (compacted to 64 cu.ft./ton)

32,000

Total Solid Waste Volume	643,841
Liquid Waste Volume (from Appendix C)	716,275

Type	Total Volume (Cu. Ft.)		Lbs. Nutrients/cu.ft.		
			N	P	K
Solid Waste	643,841		0.10	0.04	0.18
Lagoon Water	716,275		0.0042	0.0018	0.0067

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Appendix B - Third Party Waste Agreements

Name	Address	Phone	Acres Farmed
Dennis Coda	3888 SW 3 rd New Plymouth ID 83655	278-5480	300
Tom Harrold	5255 Adams Rd New Plymouth ID 83655	278-3240	70
Ralph Dykema	3830 SW 3 rd New Plymouth ID 83655	278-5507	80
Dick Fisher	4937 SE 1 st New Plymouth ID 83655	278-3340	400

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Appendix C - Sizing Output for 180 Liquid Storage

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APPENDIX C LAGOON STORAGE VOLUME WORKSHEET

Manure into lagoon: %
 Milk Cows 15% Parlor and holding pen, feed alleys
 Dry Cows 0% Feed Alleys, dry cows only
 Heifers 0%

Separator efficiency 60%

6 Manure into lagoon in cu.ft./day 66

Wash Pen.

7 Number of sprinklers in holding pen 80

8 Sprinkler output in gallons per minute (gpm) 3.5

(@50 psi 9/64 = 4.04, 5/32 = 4.98,
 11/64 = 6.01, 3/16 = 7.18)

9 Minutes per day sprinklers are used 48

No. of Strings 4

Minutes/String 4

Number of milkings per day 3

10 Days run per year 300

11 Total wash pen water in Gals/day (Lines 7 X 8 X 9 X (line 10/365) 11,047

Milkhouse and parlor:

	gals/optn.	x's/day	Gals/day
Bulk Tank	120	1	120
Pipeline	60	6	360
Backflush	0.5	0	0
Cleanup	600	3	1800
Cow Prep	0.5	3	900
Plate Cooler (ignore if recycled)			

12 Total Milkhouse and parlor in Gals/day 3180

13 Total Milking Center Water in Gals/day 14,227

5,192,700

14 Total Milking Center water in cu ft/day 1,897

Days storage required 180

15 Total storage required for Manure and barnwater (Cu.ft) 353,231

Total volume of liquid waste produced per year 716,275

Runoff Calculations :

Area 1 length in ft	1200	Milk Cow Area
Area 1 width in ft	600	
Area 2 length in ft	0	Feed Storage
Area 2 width in ft	0	
Runoff area in Sq. ft. and acres	720,000	16.53

Precipitation in 25 yr 24hr storm from map (inches) 1.8

Runoff /1000 sq ft. from Table 6 (Cu ft) 82.5

16 Cu. ft. of storage required by 25 yr/24hr. storm 59,400

Precipitation from 1 in 5 yr winter from Table 7 (in) 6.9

Payette

Runoff /1000 sq ft. from Table 7 (Cu ft) 125

17 Cu. ft. of storage required by 1 in 5 yr winter precipitation 90,000

18 Total Storage required (cu. ft.) 502,631

Lagoon 1

All water in lagoon (process and runoff):

No. of Cells	1
Slope	1:1
Depth (ft) (add 1' freeboard)	10
Width of lagoon at top (ft)	150
Width of lagoon at bottom (ft)	130
Avg Width	140
Length at top	134
Length at bottom	114
Avg Length	124
Actual Capacity in Cu. Ft	173,600

Rise over run

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Lagoon 2

No. of Cells	1	
Slope	1	:1
Depth (ft) (add 1' freeboard)	10	
Width of lagoon at top (ft)	145	1/2 base x's height
Width of lagoon at bottom(ft)	125	
Avg Width		135
Length at top	290	
Length at bottom	270	
Avg Length		280
Actual Capacity in Cu. Ft.	378,000	

Total storage 551,600
Reserve 48,969 Cu Ft

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Appendix D - Crop Rotation Balance

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Crop Rotation and Manure to spread Calculations

Rotation 1		Years in	Yield	N	P (uptake)	P (U of I)	K
		Rotation	(tons/acre)	lbs/acre	lbs/acre	lbs/acre	lbs/acre
Sudan grass		2	25	250	20	30	201
Alfalfa Hay		4	7	267 75	29	43	202
0		0	0	0	0	0	0
0		0	0	0	0	0	0
0		0	0	0	0	0	0
0		0	0	0	0	0	0
Totals		6	0	0	26	39	0

P RATE USE 39

Wastes to apply (per field):							
Field	1	2	4	5	6	NA	Total
Yr in rotation (2000	1	3	4	5	3	#N/A	Acres
Acres in field	10	20	39	34	13	#N/A	116
Factor used	0 00	0		0 617		0	
CF of Liquid to field							CF
year: 2001	-	-	-	449,945	-	#N/A	449944 904
2002	-	-	-	449,945	-	#N/A	449944 904
2003	-	-	-	449,945	-	#N/A	449944 904
2004	-	-	-	449,945	-	#N/A	449944 904
2005	-	-	-	449,945	-	#N/A	449944 904
Total	-	-	-	2,249,725	-	#N/A	5,372,061 00
Phos./acre/ yr	-	-	-	20	-	#N/A	17
% of lagoon	0%	0%	0%	63%	0%	#N/A	
Factor used	3.00	3.00	3.00	1.50	3.00		
CF of Manure to field:							CF
year: 2001	26,522						26,522
2002	26,522						26,522
2003				45,088			45,088
2004			103,437	45,088			148,525
2005		53,045	103,437		34,479	#N/A	#N/A
Tot. C F of Manure	53,045	53,045	206,874	90,176	34,479	#N/A	#N/A
Phos. /acre/ yr	39	19	39	19	19	#N/A	
Total P Applied/Yr	39	19	39	39	19	#N/A	

% total

Solids

4%

4%

7%

23%

#N/A

Solids

Liquids

LF

SF

LSF

Notes

1 Liquid should be applied to a growing crop, at appropriate times during the season. Liquid manure applications should be divided into 3 to 4 separate applications, spaced one or more irrigations apart. Too much liquid in one application will burn crops.

2 Use spring soil tests to determine appropriate N and K fertilization requirements. See conversion chart on last page of Appendix D.

3 See mineralization table last page of Appendix D.

4 Quantities in Cubic feet. Divide by volume of spreader to get loads.

Summary/ 5			CF per
Field No	Liquid*	Solid	Acre
1		2001,'02	2652
2	Annual	2005	2652
4		2004,2005	2652
5	Annual	2003,2004	1326
6		2005	2652
NA			#N/A

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Crop Rotation and Manure to spread Calculations

Rotation 2		Years in	Yield	N	P (uptake)	P (U of I)	K
		Rotation	(tons/acre)	lbs/acre	lbs/acre	lbs/acre	lbs/acre
Mattua bromegrass		5	25	250	26	39	201
0		0	0	0	0	0	0
0		0	0	0	0	0	0
0		0	0	0	0	0	0
0		0	0	0	0	0	0
0		0	0	0	0	0	0
Totals		6	0	0	22	33	0

P RATE USE 33

Wastes to apply (per field):							
Field	3						Total
Yr in rotation (2000)	1	0	0	0	0	0	Acres
Acres in field	20	0	0	0	0	0	20
Factor used	0.75	0		0		0	
CF of Liquid to field							CF
year: 2001	273,772	-	-	-	-	-	273,772
2002	273,772	-	-	-	-	-	273,772
2003	273,772	-	-	-	-	-	273,772
2004	273,772	-	-	-	-	-	273,772
2005	273,772	-	-	-	-	-	273,772
Total	1,368,859	-	-	-	-	-	5,372,061.00
Phos./acre/ yr	21	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	17
% of lagoon	38%	0%	0%	0%	0%	0%	% total
Factor used	1.00						
CF of Manure to field:							CF
year: 2001	15,046	-	-	-	-	-	15,046
2002		-	-	-	-	-	-
2003	15,046	-	-	-	-	-	15,046
2004		-	-	-	-	-	-
2005	15,046	-	-	-	-	-	15,046
Tot. C.F. of Manure	45,138	-	-	-	-	-	45,138
Phos. /acre/ yr	16	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
Total P Applied/Yr	37	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	

SF
LSF

Notes

- 1 Liquid should be applied to a growing crop, at appropriate times during the season. Liquid manure applications should be divided into 3 to 4 separate applications, spaced one or more irrigations apart. Too much liquid in one application will burn crops.
- 2 Use spring soil tests to determine appropriate N and K fertilization requirements. See conversion chart on last page of Appendix D.
- 3 See mineralization table last page of Appendix D.
- 4 Quantities in Cubic feet. Divide by volume of spreader to get loads.

Summary/ 5			CF per
Field No	Liquid*	Solid	Acre
3	Annual		752.3
0			#DIV/0!
0			#DIV/0!
0			#DIV/0!
0			#DIV/0!
0			#DIV/0!

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Table 5 work-up

Nutrients available (summarized in Table 5)												
Factor	Solids only	Amount to apply (CF/acre)	N Available each year			P Available each year			K Available each year			
Used	Solids		N1	N2	N3	P1	P2	P3	K1	K2	K3	
	Year	Prev nut credit	Total N available			Total P available			Total K available			
		0	60	0	0	0	0	0	0	0	0	
3	1	Sudan grass	217	65	26	93	9	6	414	39	24	
3	2	Sudan grass	222	65	26	102	9	6	452	39	24	
	3	Alfalfa Hay	91	0	0	15	0	0	63	0	0	
	4	Alfalfa Hay	26	0	0	6	0	0	24	0	0	
	5	Alfalfa Hay	0	0	0	0	0	0	0	0	0	
	Field 5 (L & S)	0	60	0	0	3	0	0	11	0	0	
0.617	Yr 1 liquid	13234	0	33	14	0	19	2	0	75	4	
1.5	Yr 1 solid	1326	191	78	33	71	46	5	305	19	12	
0.617	2 liquid	13234	0	33	14	0	19	2	0	75	4	
1.5	2 solid	1326	163	78	33	73	46	5	313	19	12	
0.617	3 liquid	13234	0	33	14	0	19	2	0	75	7	
	3 solid		98	0	0	30	0	0	118	0	0	
0.617	4 liquid	13234	0	33	14	0	19	2	0	75	4	
	4 solid		65	0	0	25	0	0	99	0	0	
0.617	5 liquid	13234	0	33	14	0	19	2	0	75	4	
	5 solid		52	0	0	22	0	0	87	0	0	
0.617	6 liquid	13234	0	33	14	0	19	2	0	75	4	
	6 solid		52	0	0	22	0	0	87	0	0	

Nutrients available (summarized in Table 5)												
Factor	Solids only Used	Prev nut credit	Total N available			Total P available			Total K available			
			Amount to apply (CF/acre)	N1	N2	N3	P1	P2	P3	K1	K2	K3
0	1	Mattua bromegras	0	0	0	0	0	0	0	0	0	0
0	2		0	0	0	0	0	0	0	0	0	0
0.00	3		0	0	0	0	0	0	0	0	0	0
0	4		0	0	0	0	0	0	0	0	0	0
0	5		0	0	0	0	0	0	0	0	0	0
0	Field 3 (L & S)	Prev nut credit	0	0	0	0	3	0	0	10	0	0
0.62	Yr 1 liquid	Mattua bromegras	11316	28	12	5	0	16	2	1	0	64
1	Yr 1 solid		884	52	22	9	52	31	3	2	220	138
0.62	2liquid	Mattua bromegras	11316	28	12	5	0	16	2	1	0	64
0	2 solid		0	66	0	0	22	0	0	0	87	0
0.62	3 liquid	Mattua bromegras	11316	28	12	5	0	16	2	1	0	64
1	3 solid		884	52	22	9	52	31	3	2	220	138
0.62	4 liquid	Mattua bromegras	11316	28	12	5	0	16	2	1	0	64
0	4 solid		0	66	0	0	22	0	0	0	87	0
0.62	5 liquid	Mattua bromegras	11316	28	12	5	0	16	2	1	0	64
1	5 solid		884	52	22	9	52	31	3	2	220	138
0.62	6 liquid	Mattua bromegras	11316	28	12	5	0	16	2	1	0	64
0	6 solid		0	66	0	0	22	0	0	0	87	0

General mineralization rates for nitrogen, phosphorus, and potassium for the PNW

Nutrient and location			Percent mineralized (years after application)		
			1st Year	2nd Year	3rd Year
Nitrogen					
West of Cascades			60%	20%	15%
East of Cascades, irrigated			60%	25%	10%
East of Cascades, dryland			45%	20%	15%
Phosphorus					
West of Cascades			76%	10%	6%
East of Cascades			80%	8%	5%
Potassium					
West of Cascades			80%	8%	5%
East of Cascades			85%	8%	5%

Source: How to Calculate Manure Application Rates in the Pacific Northwest, PNW0239, University of Idaho, Oregon State University, or Washington State University

Fertilizer Value Conversion Chart

1 lb P₂O₅ = 0.44 lb P

1 lb K₂O = 0.83 lb K

To convert to elemental form

Multiply P₂O₅ by 0.44 = elemental P

Multiply K₂O by 0.83 = elemental K

To convert to fertilizer form

Multiply P by 2.29 = P₂O₅

Multiply K by 1.21 = K₂O

References for Further Reading

- x Calculating the Fertilizer Value of Manure from Livestock Operations, EC1094, Oregon State University
- x Dairy Manure as a Fertilizer Source, EM8586 Oregon State University
- x How to Calculate Manure Application Rates in the Pacific Northwest, PNW0239, University of Idaho, Oregon State University, or Washington State University
- x Manure Application Rates for Forage Production, EM8585, Oregon State University

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Appendix E - Nutrient Budget Worksheets

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CALCULATIONS FOR DETERMINING N, P, & K FOR ITEM 1 OF THIS WORKSHEET

This worksheet will vary somewhat depending upon the procedure outlined in the fertilizer guide for the crop being evaluated. Refer to the crop specific fertilizer guide for the proper procedure.

A. Determine Total N Needed: Crop Being Evaluated _____ Field Number _____

Yield goal X N required¹ per unit yield = Total N needed

Yield Goal _____ X N required/unit yield _____ = Total N required _____

¹ Note: The current UI Fertilizer Guide may adjust N requirement for precipitation.

2. Residues from previous crop removed: Yes / No. If No, determine N needed to decompose residue from previous crop (_____): _____ lbs. N per ton of residue (from guide), up to 50 lbs. Generally, 1 ton of residue is produced per 20 bu. of grain. If residues are incorporated, calculate N needed to decompose residue as shown below.

[(yield _____ / 20)] X N value from the Guide (_____) = _____ Do not exceed more than 50 lbs. Use: _____

Total N required: Line 1 + Line 2: _____ Enter in A. below.

B. Determine Mineralized N: _____ % organic matter. Determine from appropriate table. Enter in B below.

C. Determine total ppm N, P, and K from soil test results.

Depth	ppm NO ₃ -N	ppm NH ₄ -N	Total ppm N		ppm P		ppm K
0 - 12 in.							
12 - 24 in.							
Total ppm							

Does total ppm P exceed threshold for any concern? Y / N

From the appropriate Fertilizer Guide, use the ppm of N, P, or K to determine crop needs and enter below for N to determine total N needs. Enter total P and K in Item 1, Pg. 1 or this worksheet.

N: Total ppm N _____ X 4 (OR FROM FERTILIZER GUIDE) = Total soil test N: _____ Enter in C below.

Summary Total N Required For The Crop

A. Total N required: _____

B. Minus mineralized N - _____

C. Minus soil test N (lbs/ac) - _____

D. Equals N fertilizer required (lbs/ac) _____ ENTER IN ITEM 1, Pg. 1

SOLVE FOR P AND K

P: Total ppm P _____¹ Total P OR P₂O₅ from the Guide _____ Convert P₂O₅ to P and enter in Item 1, Pg. 1

K: Total ppm K _____¹ Total K OR K₂O from the Guide _____¹ Convert K₂O to K enter in Item 1, Pg. 1.

¹ Caution: Some fertilizer guides express phosphate or potassium requirements as P or K and some as P₂O₅ or K₂O. Soil values are generally expressed as P or K. Convert soil test values as necessary.

P X 2.29 = P₂O₅

P₂O₅ X .44 = P

K X 1.20 = K₂O

K₂O X 0.83 = K

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NUTRIENT BUDGET

Producer: _____ Date: _____

Planned Crop Rotation: _____

Crop Evaluated on this worksheet: _____ Field Number _____ Worksheet _____ of _____

Fertilizer Guide Used: _____ Date of Guide: _____

	N lb/ac	P lb/ac	K lb/ac
1. CROP NUTRIENT REQUIREMENTS - COMPLETE Pg. 2 of this worksheet.			
2. N AND K FROM IRRIGATION WATER IF > 5 ppm			
3. LEGUME CREDITS FROM PREVIOUS CROP Use only if accounted for in the fertilizer guide. Soil Extraction Method:			
4. TOTAL POUNDS OF NUTRIENT NEEDED. (Line 1 - Line 2- Line 3)			
5. NUTRIENTS FROM SOLID WASTE From calculation or IDWMP lb/ac total available nutrients from solids are Total = solids + grazing deposition (if applicable)			
6. NUTRIENTS FROM LIQUID WASTE From calculations or IDWMP lb/ac total available nutrients from liquids are:			
7. TOTAL NUTRIENTS AVAILABLE FROM ANIMAL WASTE. (Line 5 + Line 6)			
8. UNITS OF NUTRIENTS NEEDED OR IN EXCESS Line (4) - Lines (7) = _____ If line 8 is a positive, additional nutrients are required. If line 8 is negative, nutrients are in excess. Reallocate the sources of nutrients available from lines 5 & 6.			
9. NUTRIENTS FROM COMMERCIAL FERTILIZER			

Evaluation Prepared by: _____ Date: _____

Comments: _____

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Appendix F - Irrigation Calculations

Field No: 4

No Acres 39.0

Soil Type & code nos:

Crop: Alfalfa Hay

Rooting Depth(in): 48

Max. ET for crop (Allen and Brockway, Payette):

mm/day 7.13 in/day 0.28

Available water capacity (AWC):

depth	inches	AWC (in/in)	in/in
0-12	12	0.21	0.053
13-36	24	0.21	0.105
37-48	12	0.12	0.030
			0.000
Total	48	AWC	0.19

Source Soil Survey, Payette County Area,

Management Allowable Depletion (MAD):

Irrigation Method

Irrigation efficiency

Theoretical frequency to irrigate:

available water (in) 4.95

days until depleted 17.6

Days between irrigation 7

Water to apply each irrigation (in): 2.81

Application Rate in inches /hr 0.23

Flow calculations

System flow (Gal/Min) 386.0

Row length (ft) 1320

Distance between sets (ft) 60

Gal water to apply(field) 2,980,494

Flow rate per sprinkler 5.85 6.00

Set time (hrs) 12

No sprinkler heads/line 33

No sets/line 11

No. laterals this field 2

Miner's
inches 43

Permeability			Maximum
depth	inches	Perm* (in/hr)	Rate**
0-12	12	2	0.42
13-36	24	0.6	0.13
37-48	12	3	0.36
			0.00
Total	48	1.55	

Source Soil Survey, Payette County Area,

*max. permeability in inches of travel per hour

** uptake in inches of water/hr

Permeability Class Moderately slow

Recommendations:

(Hottest week in July, Alfalfa)

Set Time: 12 hrs

Frequency = 7 days

6 gpm nozzles, 2 lines, 11
sets /line

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Table 5.1. Soil intake family designations USDA soil textural classes
(Source: USDA-NRSC Idaho Irrigation Guide. 1977).

Intake Family	Soil Textural Classes
0.3	Heavy clays, silty clay (more than 60% clay)
0.5	Clays, silt loam (lake deposits), sandy clay
1	Silty clay loam, clay loam, sandy clay loam, silt loam (alluvial deposits)
1.5	Silt loam (wind deposits), loam, very fine sandy loam
2	Sandy loam, fine sandy loam, gravelly loam
3	Very fine sand, loamy sands, gravelly sandy loam
4	Sand

Soil Intake Family Adjustment Factors

Basic Factors

Texture

Fine-textured soils generally have slower intake rates than coarse-textured soils

Structure

The arrangement of soil particles (structure) affects intake as follows

- Single grain or granular structure - most rapid intake
- Blocky or prismatic structure - moderate intake rate
- Massive or platy structure - slowest intake rate

Density

Dense soils, which consist of soils with grains tightly packed together, have slower intake rates. Well-graded (a mixture of sizes) and densely packed, can have a slow intake rate

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Table 11-2 Maximum application rate (in/hr)							
Soil texture	Application Amount in Inches						
	0.25	0.5	0.75	1	1.25	1.5	2
Sand	6	6	6	6	6	6	6
Loamy sand	6	6	4.83	4.22	3.86	3.62	3.32
Sandy loam	4.91	2.97	2.32	1.99	1.8	1.67	1.51
Loam	3.11	1.69	1.21	0.98	0.84	0.74	0.62
Silt loam	2.7	1.45	1.03	0.82	0.7	0.61	0.51
Sandy clay lo	2	1	1	1	0	0	0
Clay loam	1.27	1	0	0	0	0	0
Silty clay loa	1	1	0	0	0	0	0
Sandy clay	0.61	0	0	0	0	0	0
Silty clay	0.84	0	0	0	0	0	0
Clay	0.39	0.21	0	0	0	0	0

Note: This table is for infiltration rate for full cover conditions and initial moisture content at 50 percent of the available water capacity. Field capacity of sand through sandy loam is assumed to be at 1/10 bar.
source: NRCS "Animal Waste Handbook"

This table is for liquid manure with solids content < .5 %

1000...

Hydraulic Balance

Date to Spray Calculations (for bare, unfrozen ground):

AWC 0.21
Depth 24 inches

Power silt loam

Available water capacity (AWC):

depth	inches	WC (in/i)	in/in
0-24	24	0.225	0.225
			0.000
			0.000
			0.000
Total	24	AWC	0.23

Elijah silt loam

Available water capacity (AWC):

depth	inches	WC (in/i)	in/in
0-12	12	0.2	0.100
12-24	12	0.2	0.100
			0.000
			0.000
Total	24	AWC	0.20

Source Soil Survey, Ada County Area,

Field capacity 5.1 in
% filled 50% on
Space available 4 2.55 inches
IDAWM data for Payette

4/15/00 (Beginning of irrigation season)

Precipitation	
Month	Payette
Jan	1.9
Feb	1.48
Mar	1.36
Apr	0.81
May	0.75
Jun	0.78
Jul	0.23
Aug	0.48
Sep	0.53
Oct	0.7
Nov	1.53
Dec	2.15
25yr	1.8

Amount of application		0.5 inch	
1/2AWHC (in)		2.6	
Semi-monthly precip		Storage available	
Payette	inches		
4/1-4/15	0.405		2.145
3/15-3/30	0.68		1.465
3/1-3/15	0.68		0.785
2/14-2/28	0.74		0.045
2/1-2/14	0.74		-0.695
1/15-1/30	0.95		-1.645
1/1-1/15	0.95		-2.595
First Date to store(inch)		0.5	1-Mar

Appendix G - Soil Information

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SEP 04 2002

LOCATION ELIJAH

ID

Established Series

Rev. DA/CLM

6/93

ELIJAH SERIES

The Elijah series consists of moderately deep to a duripan, well drained soils on high terraces and basalt plains and buttes. They formed in loess or silty alluvium. Permeability is moderately slow. Slopes are 0 to 15 percent. The average annual precipitation is about 9 inches and the average annual temperature is about 48 degrees F.

TAXONOMIC CLASS: Fine-silty, mixed, mesic Xerollic Durargids

TYPICAL PEDON: Elijah silt loam - cultivated. (Colors are for dry soil unless otherwise noted.)

Ap--0 to 9 inches; brown (10YR 5/3) (10YR 6/3 crushed) silt loam, dark brown (10YR 4/3) moist; weak fine and very fine granular structure; hard, friable, sticky and slightly plastic; few roots; many very fine pores; neutral (pH 7.0); abrupt smooth boundary. (5 to 11 inches thick)

Bt1--9 to 15 inches; pale brown (10YR 6/3) light silty clay loam, dark brown (10YR 4/3) moist; about 15 percent of ped faces have coatings of dark brown (10YR 3/3) moist; weak medium prismatic structure, parting to moderate medium and fine subangular blocky; hard, friable, sticky and plastic; faint patchy clay films on faces of peds and in pores; few roots; many very fine and fine tubular pores; neutral (pH 6.9); gradual smooth boundary. (3 to 12 inches thick)

Bt2--15 to 19 inches; pale brown (10YR 6/3) and light gray (10YR 7/2) silt loam, dark brown (10YR 4/3) moist; about 10 percent of ped faces have slightly darker brown coatings; moderate fine and very fine subangular blocky structure; hard, friable, sticky and slightly plastic; few roots; faint patchy clay films on faces of peds and in pores; many very fine and fine tubular pores; few fine dark concretions; neutral (pH 7.0); abrupt wavy boundary. (3 to 13 inches thick)

2Bk--19 to 22 inches; pale brown (10YR 6/3) silt loam containing few basaltic gravel, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few roots; common very fine pores; contains small pieces of duripan from horizon below; few nodules of dense soil material; strongly effervescent with many veins, splotches, and coatings of lime; mildly alkaline (pH 7.7); abrupt broken boundary. (0 to 16 inches thick)

2Bkqm--22 to 40 inches; white (10YR 8/2) indurated silica-calcium carbonate cemented duripan, light gray (10YR 7/2) moist; upper part fractured and tending toward platy; top and bottom of plates coated with 1 mm. of white material; beneath the top coating is a light brown (7.5YR 6/3) wavy laminar layer 1-3 mm. thick, which is brown (7.5YR 5/3) moist; similar material is in places within the plates as wavy lenses and 2-5 mm. pockets; violently effervescent; moderately alkaline (pH 8.3). (6 to 40 inches thick)

TYPE LOCATION: Canyon County, Idaho; about 1 mile northeast of Nampa and 150 feet north of right-of-way boundary of Interstate Highway 80 N.; 1,350 feet east and 1,840 feet south of the northwest corner of section 13, T. 3 N., R. 2 W.

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RANGE IN CHARACTERISTICS:

Average annual soil temperature - 47 to 55 degrees F.

Depth to duripan - 20 to 40 inches

Depth to calcium carbonate - 10 to 30 inches

Depth to bedrock - 40 to more than 60 inches

Ap horizon

Value - 5 through 7 dry, 3 through 5 moist

Chroma - 2 to 4 dry or moist

Reaction - neutral or mildly alkaline

Gravel - 0 to 5 percent

Bt horizon

Hue - 7.5YR or 10YR

Value - 5 through 7 dry, 3 through 5 moist

Chroma - 2 through 4 dry or moist

Clay content - 26 to 35 percent

Texture - SIL or SICL

Reaction - neutral through moderately alkaline

Rock fragments - 0 to 5 percent

Bk and Bkq horizon

Value - 5 to 8 dry, 3 to 6 moist

Chroma - 3 or 4 dry or moist

Texture - L or SIL

Gravel content - 0 to 10 percent

Clay content - 12 to 26 percent

Reaction - mildly alkaline to strongly alkaline

Calcium carbonate equivalent - 15 to 40 percent

Bkqm horizon

Thickness of first silica lamination - 1 to 3 inches

Thickness of subsequent laminations - 1 to 8 inches

Cementation between lamination - weak to strong

Thickness of duripan - 20 to 40 inches

Other features - material underlying the duripan is stratified medium textured material or sand and gravel.

COMPETING SERIES: These are the McPan and Virtue series. McPan soils are 20 to 40 inches to bedrock. Virtue soils have more than 35 percent clay in some part of the argillic horizon.

GEOGRAPHIC SETTING: Elijah soils are on dissected high terraces and basalt plains and buttes at elevations of 2,300 to 5,200 feet. Slopes range from 0 to 15 percent. The soils formed in loess or silty alluvium overlying medium to coarse textured alluvium, lacustrine sediments, or bedrock. The climate is semiarid and has dry summers and moist winters. Average annual precipitation is 8 to 12 inches, including 0.5 to 2 feet of snowfall. Average annual air temperature is 45 to 53 degrees F. The frost-free season is 100 to 160 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Chilcott, Pigtail (T), Power, Purdam, and Vickery soils. Chilcott and Pigtail soils average more than 35 percent clay in the B2t horizon. Power soils lack a duripan. Purdam soils lack

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a thick indurated duripan. Vickery soils lack a Bt horizon. These soils all occupy landscape positions similar to the Elijah soil.

DRAINAGE AND PERMEABILITY: Well drained; medium or slow runoff; moderately slow permeability in the Bt horizon and very slow or none in the duripan.

USE AND VEGETATION: Irrigated cropland and rangeland. The principal crops are small grains, corn, potatoes, sugar beets, alfalfa, and pasture. Potential vegetation in the natural plant community is Wyoming big sagebrush, Sandberg bluegrass, bluebunch wheatgrass, and Thurber needlegrass.

DISTRIBUTION AND EXTENT: Southwestern and south central Idaho. It is of moderate extent.

MLRA OFFICE RESPONSIBLE: Portland, Oregon

SERIES ESTABLISHED: Canyon County, Idaho, 1967.

REMARKS: Diagnostic horizons and features recognized in this pedon are:

Ochric epipedon - the zone from 0 to 9 inches (Ap horizon)

Argillic horizon - the zone from 9 to 22 inches (Bt horizon)

Calcic horizon - the zone from 19 to 40 inches (2Bk and 2Bkqm horizons)

Indurated duripan - the zone from 22 to 40 inches (2Bkqm horizon)

Particle-size control section - the zone from 9 to 22 inches

National Cooperative Soil Survey
U.S.A.

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SEP 04 2002

LOCATION POWER

ID

Established Series
Rev. GHL/MEJ/CLM
03/1999

POWER SERIES

The Power series consists of very deep well drained soils on stream terraces and basalt plains and buttes. They formed in loess and silty alluvium from mixed sources. Permeability is moderately slow. Slopes are 0 to 15 percent. The average annual precipitation is about 9 inches, and the average annual temperature is about 51 degrees F.

TAXONOMIC CLASS: Fine-silty, mixed, superactive, mesic Xeric Calciargids

TYPICAL PEDON: Power silt loam - sagebrush, grass. (Colors are for dry soil unless otherwise noted.)

A--0 to 9 inches; light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; weak medium and thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; roots concentrated between vertical ped faces; fine vesicular pores (up to 1.5 mm); few fine soft dark brown concretions; neutral (pH 6.8); clear smooth boundary. (4 to 14 inches thick)

Bt--9 to 21 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; weak medium prismatic structure parting to strong fine and medium subangular blocky; very hard, friable, moderately sticky and slightly plastic; few fine roots; common very fine pores; distinct nearly continuous brown (10YR 5/3) clay films on faces of peds and in channels; few very fine dark brown concretions; slightly alkaline (pH 7.8); clear wavy boundary. (7 to 23 inches thick)

Btk--21 to 27 inches; pale brown (10YR 6/3) silt loam, brown (10YR 5/3) moist; weak medium and fine subangular blocky structure; hard, friable, moderately sticky and moderately plastic; few fine roots; common very fine pores; common faint clay films on faces of peds; few fine threads and coatings of segregated calcium carbonate; slightly effervescent; moderately alkaline (pH 8.3); clear wavy boundary. (3 to 8 inches thick)

Bk1--27 to 31 inches; very pale brown (10YR 7/3) silt loam, pale brown (10YR 6/3) moist; massive; slightly hard, friable, moderately sticky and moderately plastic; few fine roots; few very fine pores; many threads and splotches of segregated lime and spots of gypsum crystals; strongly effervescent; moderately alkaline (pH 8.0); clear wavy boundary. (3 to 10 inches thick)

Bk2--31 to 46 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; threads of segregated lime; moderately effervescent; slightly alkaline (pH 8.4); clear smooth boundary. (15 to 20 inches thick)

2Bk3--46 to 60 inches; very pale brown (10YR 7/3) loam, brown (10YR 5/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; threads of segregated lime; slightly effervescent; moderately alkaline (pH 8.4).

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TYPE LOCATION: Gem County, Idaho; 2/3 mile southwest of Cooper School;
northeast 1/4, northwest 1/4, northwest 1/4, section 22, T. 7 N., R. 3 W.

RANGE IN CHARACTERISTICS:

Depth to bedrock - more than 60 inches
Average annual soil temperature - 47 to 54 degrees F.
The particle-size control section averages less than 15 percent sand coarser
than very fine sand and 24 to 35 percent clay.
Depth to calcium carbonate - 11 to 37 inches
BA horizons are present in some pedons

A horizon

Hue - 2.5Y or 10YR
Value - 5 through 7 dry, 3 or 4 moist
Chroma - 2 to 4 dry or moist
Reaction - neutral to slightly alkaline

Bt and Btk horizons

Value - 5 through 7 dry, 3 through 5 moist
Chroma - 3 or 4 dry or moist
Percent calcium carbonate - 0 to 5 percent
Texture - L, SIL, CL, or SICL
Percent clay - 24 to 35
Reaction - neutral to moderately alkaline

Bk1 and Bk2 horizons

Value - 6 through 8 dry, 4 through 7 moist
Chroma - 2 through 4 dry or moist
Percent calcium carbonate - 15 to 30
Texture - SIL, L
Reaction - slightly to moderately alkaline

2Bk3 horizon

Value - 6 through 8 dry, 4 through 7 moist
Chroma - 2 through 4 dry and moist
Percent calcium carbonate - 10 to 15 percent
Texture - SIL, L, VFSL
Gravel - 0 to 10 percent
Cemented nodules - 0 to 15 percent
Reaction - moderately to strongly alkaline

2Bkq horizon - present in some pedons

COMPETING SERIES: These are the Greenleaf and Larwood series. Greenleaf soils
have dense laminated silt lake sediments at 12 to 40 inches. Larwood soils need
review for adequate separation from the Power series.

GEOGRAPHIC SETTING: Power soils are on basalt plains and buttes and old stream
terraces. Slopes are 0 to 15 percent. Elevations range from 2,000 to 4,800
feet. The soil formed in loess or silty alluvium underlain by a moderately
coarse textured alluvium derived from acid igneous rocks and basalt. The
climate is semi-arid with cool moist winters and hot dry summers. The frost
free season is 100 to 160 days and the average annual precipitation is 8 to 12
inches, including 1 to 3 feet of snow. Average annual air temperature is 45 to
52 degrees F.

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GEOGRAPHICALLY ASSOCIATED SOILS: These are the Chilcott, Jenness, Lanktree, Lolalita, Owinza, and Purdam soils. Chilcott, Owinza, and Lanktree soils have Bt horizons containing more than 35 percent clay, and Chilcott soils have duripans. Jenness and Lolalita soils lack argillic horizons. Purdam soils have a weakly expressed duripan above 40 inches. These soils all occur on landscape positions similar to Power soils.

DRAINAGE AND PERMEABILITY: Well drained, slow or medium runoff; moderately slow permeability.

USE AND VEGETATION: Used for rangeland and irrigated cropland. Principal crops are small grains, potatoes, sugar beets, beans, and alfalfa hay. Potential vegetation in the natural plant community is Wyoming big sagebrush, Thurber needlegrass, and bluebunch wheatgrass with basin big sagebrush in some areas.

DISTRIBUTION AND EXTENT: Southwestern and south central Idaho. The soil is moderately extensive.

MLRA OFFICE RESPONSIBLE: Portland, Oregon

SERIES ESTABLISHED: Gem County, Idaho, 1949.

REMARKS: Diagnostic horizons and other features recognized in this pedon are:

Ochric epipedon - The zone from 0 to 9 inches (the A horizon)

Argillic horizon - The zone from 9 to 27 inches (the Bt horizons)

Calcic horizon - The zone from 27 to 46 inches (the Bk1 and Bk2 horizons)

Particle-size control section - The zone from 9 to 27 inches (the argillic horizon)

National Cooperative Soil Survey
U.S.A.

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Appendix H - Soil Sample Bulletin

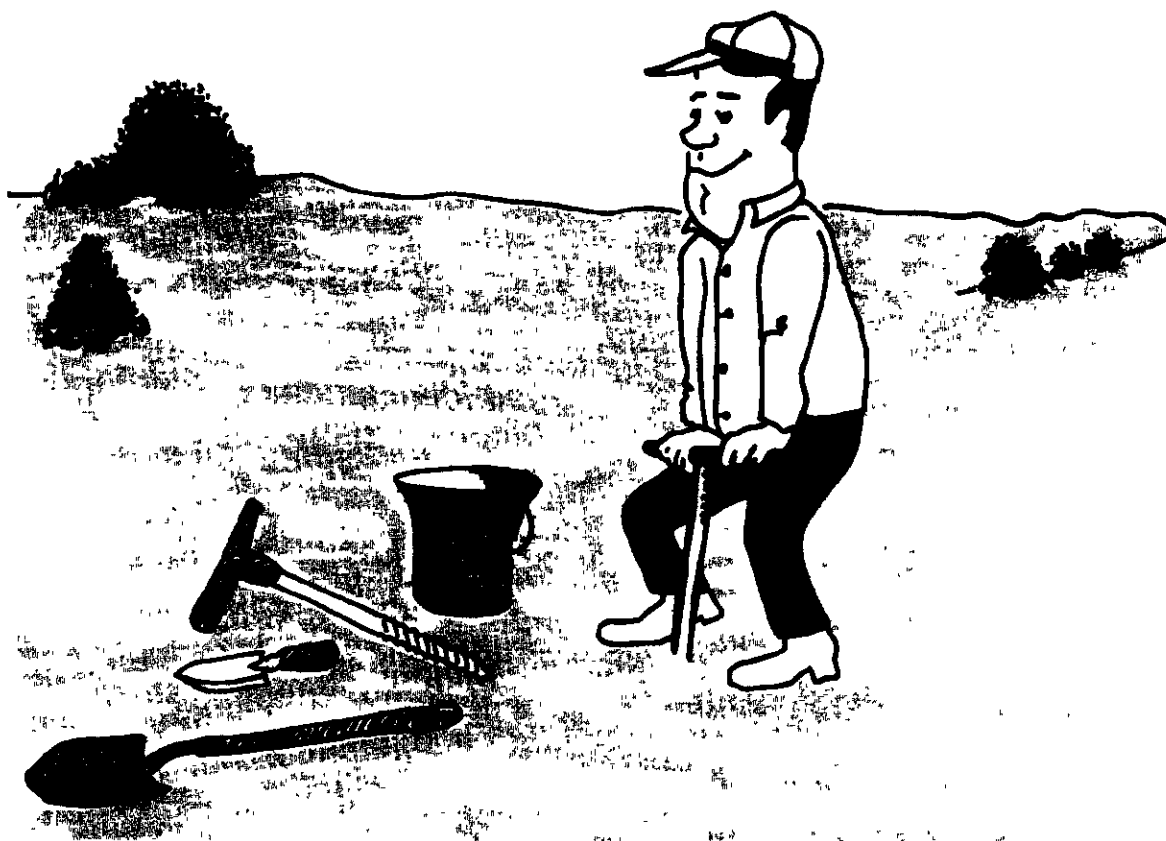
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Soil Sampling

Bulletin 704
(revised)

R. L. Mahler and
T. A. Tindall



*College of
Agriculture*



University of Idaho
Cooperative Extension System

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SEP 04 2002



State of Idaho

DEPARTMENT OF WATER RESOURCES

Western Region, 2735 Airport Way, Boise, Idaho 83705-5082 - (208) 334-2190

FAX (208) 334-2348

~~March 30, 2001~~
May 30, 2001

DIRK KEMPTHORNE
Governor

KARL J. DREHER
Director

Legal Notice Department - Marilyn
Independent Enterprise
PO Box 520
Payette ID 83661

RE: Application for Permit No. 65-22349

Dear LEGAL NOTICE DEPARTMENT:

Enclosed you will find a legal notice which we wish to have published in your newspaper on the dates indicated (once a week for two consecutive weekly issues). If you cannot publish the notice on the proposed dates, please contact us immediately.

An affidavit of publication must be submitted to the Department along with the publication bill. Please send the affidavit and bill to this office before ~~04/23/2001~~ 6/25/01. Your cooperation is appreciated.

Sincerely


Sue Taylor
Sr. Secretary

MICROFILMED

FEB 04 2002

The following application(s) have been filed to appropriate the public waters of the State of Idaho:

65-22349

FRANK TEUNISSEN
3749 SW 3RD AVE
NEW PLYMOUTH ID 83655

Point(s) of Diversion	SEnw	S17 T07N R04W PAYETTE County	Source GROUND WATER, GROUND WATER, GROUND WATER
Point(s) of Diversion	SEnw	S17 T07N R04W PAYETTE County	Source GROUND WATER, GROUND WATER, GROUND WATER
Point(s) of Diversion	NESW	S17 T07N R04W PAYETTE County	Source GROUND WATER, GROUND WATER, GROUND WATER

Use: COMMERCIAL 01/01 To 12/31 0.5 CFS

Use: STOCKWATER 01/01 To 12/31 0.5 CFS

Use: DOMESTIC 01/01 To 12/31 0.04 CFS

Total Diversion: 0.5 CFS

Date Filed: 03/13/2001

Place Of Use: COMMERCIAL

T07N R04W S17 SWNW SENW NESW NWSW

Place Of Use: STOCKWATER

T07N R04W S17 SENW NESW

Place Of Use: DOMESTIC

T07N R04W S17 SENW

Remark: Applicant agrees to mitigate consumptive use in the future as needed.

Permits will be subject to all prior water rights. Protests may be submitted based on the criteria of Sec 42-203A, Idaho Code.

Any protest against the approval of this application must be filed with the Director, Dept. of Water Resource, Western Region, 2735 Airport Wy, Boise ID 83705 together with a protest fee of \$25.00 for each application on or before ~~04/23/2001~~ 6/25/01. The protestant must also send a copy of the protest to the applicant.

KARL J DREHER, Director

Published on ~~April 4 and 11, 2001~~

June 6 + 13, 2001

MICROFILMED

FEB 04 2002

March 30, 2001

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Independent Enterprise
PO Box 520
Payette ID 83661

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Use:	COMMERCIAL	01/01 To 12/31 0.5 CFS	
Use:	STOCKWATER	01/01 To 12/31 0.5 CFS	
Use:	DOMESTIC	01/01 To 12/31 0.04 CFS	
	Total Diversion	0.5 CFS	

Date Filed: 03/13/2001

Place Of Use: COMMERCIAL

T07N R04W S17 S17W SENW NESW NWSW

Place Of Use: STOCKWATER

T07N R04W S17 SENW NESW

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T07N R04W S17 SENW

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KARL J DREHER, Director

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APR 14 2002