Public Services

128 North Second Street · Fourth Floor Courthouse · Yakima, Washington 98901
(509) 574-2300 · 1-800-572-7354 · FAX (509) 574-2301 · www.co.yakima.wa.us
VERN M. REDIFER, P.E., Director

July 16, 2015

Charles McKinney
Department of Ecology, Central Region Office
1250 West Alder Street
Union Gap, WA 98903

Re: **Lower Yakima Valley GWMA - 2015 Second-Quarter Report (IAA No. C 1200235)**

Dear Charlie:

Enclosed please find one (1) copy of Yakima County's second-quarter report as required under Attachment A, Statement of Work, Agreement No. C 1200235 between the State of Washington Department of Ecology and Yakima County.

This report addresses deliverables 1.1 and 2.2 as required under the agreement.

Deliverable 2.1, invoices, to be sent under separate cover.

If you have any questions, please let me know.

Thank you.

Lisa H. Freund, Administrative Manager
Yakima County Public Services

enclosure

IAA No. C 1200235 – Second Quarter 2015 Report
Lower Yakima Valley GWMA
June 30, 2015

TASK 1 - ADMINISTRATIVE FUNCTIONS
DELIVERABLES

1.1 Meeting Records

For each meeting of the GWAC, submit a copy of the agenda, minutes, attendance and public meeting notice at the end of each quarter.

Attachment (A) includes the draft GWAC meeting summaries of April 16 and June 18, 2015; the Education and Public Outreach (EPO) Working Group summaries of May 6 and June 3, 2015; the Livestock/CAFO Working Group summary of April 9, 2015; the Irrigated Ag Working Group (IAWG) summaries of April 6 and June 8, 2015; the Residential, Commercial, Industrial, and Municipal (RCIM) Working Group summaries of April 30 and June 25, 2015; the Data Collection, Characterization and Monitoring Working Group summaries of April 9 and May 19, 2015; the joint Data and Livestock working group summaries of June 11 and June 25, 2015; and the Regulatory Framework Working Group summaries of April 2, April 23, May 13 and June 10, 2015. The Funding Working Group did not hold a meeting in the second quarter.

TASK 2 - PROGRAM FUNCTIONS
DELIVERABLES

2.2 Status Report

Submit written quarterly status reports summarizing GWAC plans, activities and work products, and describing any interlocal agreements or other contracts by the end of each quarter.

Work Plans and Products

Deep Soil Sampling - Round Two. 48 fields were sampled in the second quarter with no repeats from round one. Sampling focused on triticale, grapes and mint. The information was collected in a report that will inform various sections of the Plan.

Groundwater Management Plan. A draft table of contents was developed and presented to the GWAC at its June meeting. Work on the first section, "Characterization of the Area," was initiated. Characterization plates were developed using Geographic Information System (GIS) data—elevation, zoning, geology, and USGS layers of groundwater.

Data from the Yakima County Assessor's office and GIS were gathered to develop a geospatial map illustrating the location of septic tanks in conjunction with U.S. Census data including number of tenants, average age, and more. These maps and the data contained within them will support the Nitrogen Loading Assessment.

Nitrogen Loading Assessment Methodology. The Data Collection and Livestock/Data working groups held two joint meetings in the second quarter to consider several methodologies to determine nitrogen loading for the Livestock Loading Assessment. After review and discussion, the groups agreed to recommend Darcy's methodology to the GWAC.

High Risk Well Assessment Surveying Phase I and II. In May, sampling results letters and educational materials were sent to the 172 participants of the Phase I survey. The letters also announced Phase II of the assessment survey, slated to begin in the third quarter.

Membership update. Bill Dunbar, Region X Director of the United States Environmental Protection Agency, was appointed to serve as the replacement for Tom Eaton until another staff person was identified. Jessica Black, Assistant Professor of Environmental Science at Heritage University, was also appointed to the GWAC.

The Round Two Deep Soil Sampling Data Report, the GWMA Plan Table of Contents, and sample letter and educational materials sent to the well assessment participants are included as Attachment (B).

Working Group Activities:

Education and Public Outreach (Lisa Freund, Chair)
High Risk Well Assessment Surveying – Phase I Results. The EPO, on behalf of the GWAC, sent a direct mail piece to the 172 participants of the Phase 1 survey that contained the participant's sampling results, a letter explaining the results, and educational materials. In the letter, the GWAC announced the next round of surveying and asked recipients to invite friends and neighbors served by private or shared wells to participate.

Phase II. The EPO discussed and agreed to use Phase I methodology and messaging for Phase II. As such, areas of known high nitrates will be targeted as well as areas with little nitrate data. The mailing lists for households will be increased from 600 in Phase I to 1000 in Phase II. The EPO's goal is to obtain 300 additional well samples and completed surveys.

Livestock/CAFO (Charlie McKinney, Chair)
The group met on April 9 to discuss the Nitrogen Loading Assessment study and how the Livestock/CAFO group can help inform the study. The group agreed that a technical expert should be hired to conduct the literature review, to help assess the data and to recommend a methodology.

Following that meeting, Kirk Cook noted that a consultant would likely duplicate work already under contract with Department of Agriculture. Accordingly, it was decided to meet jointly so all parties could share in the discussion prior to the June GWAC meeting.

Data Collection and Livestock/CAFO Joint Meetings (Kirk Cook and Charlie McKinney, Chairs)
Nitrogen Loading Assessment. The groups met on June 11 and 25 to discuss the initial results of the Livestock Loading Assessment and to discuss the concept and methodology for estimating nitrogen loading from lagoons/ponds and nitrogen contributions from livestock corrals/pens. 230 lagoons and ponds and 120 corrals, pens and compost facilities were identified in the Lower Yakima Valley GWMA.

The groups considered three methodologies: 1. UC Davis, 2. USGS/Ecology and 3. Darcy's equation. At the June 25 meeting members agreed to use Darcy's equation.

Irrigated Ag (IAWG) (Jim Trull, Chair)
The group met on April 6 and June 8 to discuss four key points: 1. Round Two of the deep soil sampling - 48 fields were sampled (33 fields were sampled in Round One). 2. Best Management Practices (BMPs) - the group identified those BMPs positively impacting reduction of nitrates reaching the groundwater. The group concluded that each BMP needs a brief summary to further define and clarify the practice. 3. Irrigation Water Management - the group discussed the need for data on the problem of over-irrigation and the resultant leaching of nitrates below the root zone. 4. Nutrient Management - the group will be brainstorming options on what needs to improve and possible incentives to get participation.

Residential, Commercial, Industrial, and Municipal (RCIM) (Robert Farrell, Chair)
The group met on April 30 and June 25 to address the following work topics:

- Nitrogen loading to septic systems was estimated from literature values and the design values used by the Yakima Health District. The Data working group (Melanie Redding - Ecology) will estimate the loading from the septic systems to the aquifer.

- Estimate of Nitrogen loading to residential and municipal lawns: 40 – 60 lbs/acre/year has been suggested as an initial estimate for managed municipal lawns; 2 - 3 lbs/ acre/year for residential lawns, based upon information provided by commercial applicators.

- Estimate of Nitrogen loading at hobby farms. An attempt to define hobby farms based upon area, and whether these are actually included in loadings, was discussed. It was determined that this is being addressed by the IAWG.

- Nitrogen loading resulting from vegetative by-products of food processing industries was examined. It was determined that these are probably regulated by the Department of Ecology.

Regulatory Framework (Jean Mendoza, Chair)
At its April 2 meeting, Jean Mendoza was selected to serve as chair. The group expanded its study session work in order to attain more in-depth understanding of the ways that regulatory and non-regulatory agencies can impact activities that contribute to nitrate flow to the groundwater.

In April the group met with Bonda Habets and her team from the Natural Resources Conservation Service (NRCS). This agency contracts with growers and producers to implement site-specific projects that reduce both air and water pollution. NRCS has no regulatory powers.

In May the group met to consider a path of study through the end of the year. There will be monthly round table study sessions and an attempt to quantify the impact from each group. Potential gaps in the regulatory framework will be identified and discussed in depth by the group prior to presentation to the GWAC. Specific goals and objectives were suggested but not approved.

In June the group met with Laurie Crowe from the South Yakima Conservation District and with Ginny Prest from the Washington State Department of Agriculture Dairy Nutrient Management Program (DNMP) to learn more about their respective programs. These agencies have a major influence on agricultural activities that potentially contribute to nitrate pollution of groundwater. The group agreed to skip a July meeting and continue the discussion with Ginny Prest regarding the DNMP in August.

GWMA Website
The website and calendar continued to be maintained in real time. The EPO's web update will be integrated with the County's migration to a new web program, slated for completion later this year.

Contracts and Interlocal Agreements:
Amendment Number 3 to the Agreement between State of Washington Department of Ecology and Yakima County was executed on June 25, 2015. The amendment extended the performance period from June 30, 2015 to September 30, 2015 and amended deliverable 4.1.

The amendment is included as Attachment (C)

Attachment A

- GWAC Attendance Roster Record for April 16 and June 18, 2015.
- Draft GWAC summary for April 16, 2015, Public Meeting Notice and Agenda; Draft GWAC summary for June 18, 2015, Public Meeting Notice and Agenda.
- Education and Public Outreach (EPO) Working Group summaries of May 6 and June 3, 2015.
- Livestock/CAFO Working Group summary April 9, 2015.
- Irrigated Ag Working Group (IAWG) summaries of April 6 and June 8, 2015.
- Residential, Commercial, Industrial and Municipal (RCIM) Working Group summaries of April 30 and June 25, 2015.
- Data Collection, Characterization and Monitoring Working Group summaries of April 9 and May 19, 2015.
- Joint Data Collection, Characterization and Monitoring and Livestock/CAFO Working Group summaries of June 11 and June 25, 2015.
- Regulatory Framework (REG) Working Group summaries of April 2, April 23, May 13, and June 10, 2015.

GWAC ATTENDANCE ROSTER

Second Quarter 2015

Member	16-Apr-2015	18-Jun-2015
Stuart Turner	Absent	Present
Chelsea Durfey	Present	Absent
Bud Rogers	Present	Present
Kathleen Rogers	Present	Present
Patricia Newhouse	Present	Present
Sue Wedam	Present	Absent
Doug Simpson	Absent	Absent
Jean Mendoza	Present	Present
Eric Anderson	Absent	Absent
Jan Whitefoot	Absent	Absent
Jim Dyjak	Present	Present
Steve George	Present	Present
Frank Lyall	Present	Present
Jason Sheehan	Present	Present
Dan DeGroot	Present	Present
Jim Trull	Present	Present
Ron Cowin	Absent	Absent
Laurie Crowe	Absent	Present
Jim Newhouse	Absent	Absent
Robert Farrell	Present	Present
John Van Wingerden	Absent	Absent
Rand Elliott	Present	Absent
Vern Redifer	Present	Present
Ryan Ibach	Present	Present
Dr. Troy Peters	Present	Present
Bill Dunbar	Present	Present
Marie Jennings	Present	Absent
Elizabeth Sanchey	Absent	Present
Tom Ring	Absent	Absent
Kirk Cook	Absent	Present
Virginia "Ginny" Prest	Present	Absent
Andy Cervantes	Present	Present
Ginny Stern	Absent	Absent
Charlie McKinney	Present	Present
Tom Tebb	Absent	Absent
Lino Guerra	Absent	Absent
Rick Perez	Absent	Absent
Jessica Black	Present	Absent

YAKIMA VALLEY GROUNDWATER MANAGEMENT AREA ADVISORY COMMITTEE (GWAC)

MEETING SUMMARY

Thursday, April 16, 2015 – 5:00 p.m. – 7:00 p.m.

KDNA Conference Room
121 S. Sunnyside, Granger, WA

Note: This document is only a summary of issues and actions of this meeting. It is not intended to be a transcription of the meeting, but an overview of points raised and responses from Yakima County and Groundwater Advisory Committee members. It may not fully represent the ideas discussed or opinions given. Examination of this document cannot equal or replace attendance.

I. Call to Order

Roll Call: This meeting was called to order at 5:05 p.m. by Jim Davenport, Facilitator.

Member	Seat	Present	Absent
Stuart Turner	Agronomist, Turner and Co.,		✓
Chelsea Durfey		✓	
Bud Rogers	Lower Valley Community Representative Position 1	✓	
Kathleen Rogers	Lower Valley Community Representative Position 1 (alternate)	✓	
Patricia Newhouse	Lower Valley Community Representative Position 2	✓	
Sue Wedam	Lower Valley Community Representative Position 2 (alternate)	✓	
Doug Simpson	Irrigated Crop Producer		✓
Jean Mendoza	Friends of Toppenish Creek	✓	
Eric Anderson	Friends of Toppenish Creek (alternate)		✓
Jan Whitefoot	Concerned Citizens of the Yakama Reservation		✓
Jim Dyjak	Concerned Citizens of the Yakama Reservation (alternate)	✓	
Steve George	Yakima County Farm Bureau	✓	
Frank Lyall	Yakima County Farm Bureau (alternate)	✓	
Jason Sheehan	Yakima Dairy Federation	✓	
Dan DeGroot	Yakima Dairy Federation (alternate)	✓	

Jim Trull	Roza-Sunnyside Joint Board of Control	✓	
Ron Cowin	Roza-Sunnyside Joint Board of Control (alternate)		✓
Laurie Crowe	South Yakima Conservation District		✓
Jim Newhouse	South Yakima Conservation District (alternate)		✓
Robert Farrell	Port of Sunnyside	✓	
John Van Wingerden	Port of Sunnyside (alternate)		✓
Rand Elliott	Yakima County Board of Commissioners	✓	
Vern Redifer	Yakima County Board of Commissioners (alternate)	✓	
Ryan Ibach	Yakima Health District	✓	
Dr. Troy Peters	WSU Irrigated Agriculture Research and Extension Center	✓	
Bill Dunbar	U.S. Environmental Protection Agency	✓	
Marie Jennings	U.S. Environmental Protection Agency (alternate)	✓	
Elizabeth Sanchey	Yakama Nation		✓
Tom Ring	Yakama Nation (alternate)		✓
Kirk Cook	WA Department of Agriculture		✓
Virginia "Ginny" Prest	WA Department of Agriculture (alternate)	✓	
Andy Cervantes	WA Department of Health	✓	
Ginny Stern	WA Department of Health (alternate)		✓
Charlie McKinney	WA Department of Ecology	✓	
Tom Tebb	WA Department of Ecology (alternate)		✓
Lino Guerra	Hispanic Community Representative		✓
Rick Perez	Hispanic Community Representative (alternate)		✓

II. Welcome & Meeting Overview

Moment of Silence

Jim Davenport inquired from the members if they had any suggestions for the Agenda; there were none.

Jim Davenport announced that to ensure that meeting minutes and notifications are distributed accurately, it was time to confirm current Work Group Membership and contact information. All members were asked to review the printed Work Group lists before they left and confirm their information is correct.

This led to a discussion around who is able to vote at Work Group meetings; those in attendance, GWAC Members only, or Formal Work Group Members. There was clarification that Work Groups could have members who were not GWAC members as all decisions

made by the Work Groups are presented to the GWAC. The decision was then between allowing all in attendance at a Work Group meeting to vote or only Formal Work Group Members. Pros and Cons for each was discussed. Commissioner Elliott clarified that in April of 2013 the GWAC decided that only Formal Work Group members could vote – should a formal vote be called. The GWAC agreed by consensus to keep that decision in place.

III. New Members

Introduction of new members:

- Bill Dunbar, Region X Director of the United States Environmental Protection Agency will be serving as the replacement for Tom Eaton until another staff person is identified.
- Ryan Ibach, Environmental Health Director of the Yakima Health District is replacing Gordon Kelly who retired last month.
- Jessica Black, Assistant Professor of Environmental Science at Heritage University, new member.

IV. Working Group Reports:

Livestock/CAFO Working Group – Charlie McKinney

Charlie McKinney reported on the April 9, 2015 meeting. He first noted that ~~T~~the ~~Work Group~~ Dept of Ag/Yakima County N Loading Assessment team is currently assessing dairies, both on ground and via aerial photography, for inclusion into the Nitrogen Loading Assessment. They ~~group~~ will be identifying pens, manure storage areas, lagoons, and soil types to determine contributing sources to nitrates levels. ~~Moving forward~~ It will be up to the CAFO/Livestock ~~the~~ Work Group to come up with leakage and N contribution factors to assign to these livestock components. The Work Group would like to hire a consultant (through the County), familiar with the area~~s~~, to provide an objective, unbiased assessment of the literature and data. While this is not expected to be accomplished until January 2016, they will not be delaying the Nitrogen Loading Assessment as they can move on to working on other potential sources and then come back and plug in the N factors obtained from the CAFO/Livestock Work Group.~~any data they collect can be added at a later time providing accurate localized data.~~ The meeting time for this group is set for the 1st Thursday of each month, with May 7th being the next meeting day. [Editorial note: the May 7 meeting was subsequently postponed]

Education and Public Outreach (EPO) Working Group – Andy Cervantes

The EPO Working Group completed their analysis of the High Risk Well Assessment Survey and have drafted a letter to inform those who participated in the survey with their results for both Nitrates and Coliform. There are several versions of the letter depending on their results: nitrates ≤ 4.99; nitrates between 5.0 and 9.99 mg/L; nitrates ≥ 10 mg/L, as well as variations addressing satisfactory and unsatisfactory coliform results. The letter will provide information on the sampling results, areas of concern and a fact sheet developed by the Washington Department of Health about nitrates in the water. All resources and the letter will be in both English and Spanish and will identify who to contact for more information. After much discussion about the fact sheet developed by the Washington Department of Health, it was determined that current pricing for sample testing should be provided or a contact number for individuals to call to get pricing. Andy stated that he would provide the group with a Word document to be able to localize the flyer.

RCIM Working Group – Robert Farrell

Robert Farrell reported on the March 26, 2015 meeting. At this meeting, Avery Richardson discussed issues on abandoned wells, raising public awareness about Decommissioning Wells. They are looking to gather existing information to share with the public on how to appropriately decommission wells and the impact that abandoning wells has on the aquifers.

Data Working Group – Jim Davenport

Vern Redifer presented information that was discussed at the April 9, 2015 meeting. Data from both the Assessor's office and GIS office have been gathered to develop a geospatial map illustrating the location of septic tanks in conjunction with US Census data including number of tenants, average age, and more. These maps and the data contained within them will be a portion of the Nitrate Loading Assessment.

Regulatory Framework Working Group – Jean Mendoza

Jean Mendoza announced that the next study session will be on April 23, 2015; the session will include a presentation by the Natural Resource Conservation Service (NCRS). Topics include: NRCS Budget and Focus of Funding for Washington State and Yakima County, NRCS 590 Nutrient Management Standards and Policy, NRCS 521 Lagoon Management Standards and Policy, NRCS 359 Waste Treatment Lagoon Standards and Policy, NRCS Irrigation

Management Guidelines, and NRCS Implementation of Environmental Justice Initiatives. An email with more information about the meeting will be sent out.

Irrigated Ag Working Group – Jim Trull

Jim Trull reported on the April 6, 2015 meeting stating that Round 2 of the Deep Soil Sampling will include 50 new fields with no repeats from the first Round. They are hoping that by fall they will have even more participants so they can obtain more data. The group is also working on BMP's for Irrigated Ag and how to use them for education and incentives. They are looking at the GWMA timeline and will give Vern a response soon regarding the schedule of their current tasks.

V. GWMA PLAN TIMELINE STATUS: Vern Redifer

Vern presented an update on the GWMA Program timeline. He has been getting feedback from the Working Groups and is waiting on more Nitrate Loading information from Kirk Cook before finalizing it. The goal of the timeline is to track progress and show accountablity as well as provide information for the upcoming contracts between Department of Ecology and Yakima County which will require a delivery date to deliver the final program. Currently the timeline shows a 2017 deadline but it depends on Deep Soil Sampling (DSS) linked with the Nitrogen Loading Assessment.

VI. Status of groundwater Monitoring System Design

Vern spoke about GWAC's decision to have an ambient groundwater monitoring system. He met with the Pacific Groundwater to brainstorm the scope of work designed for the GWMA area. Once information is compiled they will discuss with the Data Working Group to make sure all points are covered.

VII. Committee Business

The February 19, 2014 meeting summary was approved as presented.

VIII. GWAC Member Comments

The Deptment of Ecology will be holding a meeting at 6 p.m., April 21 at the Zillah Civic Center in Zillah to discuss water quality permit for concentrated animal feeding operations.

IX. Public Comment:

Jim Davenport introduced Tung Njuyen, a PhD candidate at Washinton State University. He is currently working on a physical model of the Lower Yakima Valley Basin examining how groundwater travels. While he is utilizing USGS model data, he needs nitrate source data such as what will be collected from the Nitrate Loading Assessment. He will feed this source data into a transport model to hypothesize nitrate movement and contribution to Yakima River Surface water. He predicts completing the model by December of 2015 and entering the nitrogen source data into that model by December of 2016.

X. Next Steps:

Next Meeting:

- June 18, 2015 5:00 PM
  Location: Radio KDNA, 121 Sunnyside Ave, Granger, WA 98932

2015 Meeting Calendar

June 18, 2015
August 20, 2015
October 15, 2015
December 17, 2015 (tentative, if needed)

The meeting was adjourned at 6:50 p.m.

Meeting summary approved by the GWAC on _____.

Affidavit of Publication

STATE OF WASHINGTON
COUNTY OF YAKIMA SS

Timothy J. Graff, being first duly sworn on oath deposes and says that he is the Publisher of the DAILY SUN NEWS, a daily newspaper.

That said newspaper is a legal newspaper and it is now and has been for more than six months prior to the date of publications hereinafter referred to, published in the English language continually as a daily newspaper in the city of Sunnyside, YAKIMA County, Washington, and it is now and during all of said time printed in an office maintained at the aforesaid place of publication of said newspaper, and that the said Daily Sun News was on the 4th Day of April, 1969 approved as a legal newspaper by the Superior Court of said Yakima County.

That the annexed is a true copy of a LEGAL PUBLICATION -
Yakima County Public Services
Groundwater Mtg 4-16-15
published in regular issues (and not in supplemental forms) of said newspaper once each week for a period of 1 consecutive issue(s) commencing 04/09/15 and ending on 04/09/15, both dates inclusive, and that such newspaper was regularly distributed to its subscribers during all of said period. That the full amount of the fee charged for the foregoing publication is the sum of $ 33.75, amount has been paid in full, at the rate of $7.50 per column inch per insertion.

Tim Graff

Subscribed and sworn to before me 04/09/15

Marnie C. Gibbs

Notary Public in and for
the State of Washington
030110-00000

MARNIE C GIBBS
NOTARY PUBLIC
STATE OF WASHINGTON
COMMISSION EXPIRES
NOVEMBER 15, 2017

Notice of Public Meeting
Lower Yakima Valley Groundwater Advisory Committee

NOTICE IS HEREBY GIVEN that Yakima County is holding a public meeting of the Lower Yakima Valley Groundwater Advisory Committee on Thursday, April 16, 2015 at 5:00 PM at Radio KDNA Conference rooms 1 & 2, 121 Sunnyside Ave., Granger, WA 98932 pursuant to Chapter 173-100-080 WAC Ground Water Management Areas and Programs.

For Additional Information

To learn more about the Lower Yakima Valley Groundwater Management Area, the Groundwater Advisory Committee, and its goals and objectives, please see the Lower Yakima Valley Groundwater Management Area on the County webpage at: http://www.yakimacounty.us/gwma/

For more information about the meeting, please contact Lisa Freund, Yakima County Public Services Administrative Manager at 574-2300.

Dated this Wed., April 8, 2015
PUBLISH: DAILY SUN NEWS
April 9, 2015

YAKIMA HERALD REPUBLIC

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-Ad Proof-

This is the proof of your ad scheduled to run on the dates indicated below.
Please confirm placement prior to deadline, by contacting your account rep at (509) 577-7740.

Date:	04/08/15
Account #:	110536
Company Name:	YAKIMA COUNTY SURFACE WATER MANAGEMENT
Contact:	Tina Beck,AP
Address:	128 NORTH 2ND STREET ROOM 408 YAKIMA, WA 98901
Telephone:	(509) 574-2343

Ad ID:	533931
Start:	04/09/15
Stop:	04/09/15
Total Cost:	$67.70
Agate Lines:	38
# of Inserts:	2
Ad Class:	6021
Account Rep:	Simon Sizer
Phone #	(509) 577-7740
Email:	ssizer@yakimaherald.com

Run Dates:
Yakima Herald-Republic 04/09/15
YakimaHerald.com 04/09/15

Ad Proof

Yakima County

Notice of Public Meeting
Lower Yakima Valley
Groundwater Advisory Committee

NOTICE IS HEREBY GIVEN that Yakima County is holding a public meeting of the Lower Yakima Valley Groundwater Advisory Committee on **Thursday, April 16, 2015 at 5:00 PM at Radio KDNA Conference rooms 1 & 2, 121 Sunnyside Ave., Granger, WA 98932** pursuant to Chapter 173-100-080 WAC Ground Water Management Areas and Programs.

For Additional Information
To learn more about the Lower Yakima Valley Groundwater Management Area, the Groundwater Advisory Committee, and its goals and objectives, please see the Lower Yakima Valley Groundwater Management Area on the County webpage at: http://*www.yakimacounty.us/gwma/*

For more information about the meeting, please contact Lisa Freund, Yakima County Public Services Administrative Manager at 574-2300.
Dated this **Wednesday, April 8, 2015**

(533931) April 9, 2015

LOWER YAKIMA VALLEY

GROUNDWATER ADVISORY COMMITTEE

Groundwater Management Area (GWMA):
The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards

Meeting Time and Location

Thursday, April 16, 2015, 5:00 - 7:00 p.m.

Radio KDNA
121 Sunnyside Ave.
Granger, WA 98932

Regular GWAC Meeting

Agenda

Time	Topic	
5:00 – 5:10 p.m.	Welcome & Meeting Overview	
5:10– 5:15 p.m.	New Members Working Group Member & Interested Party Updates	
5:15 – 6:15 p.m.	Working Group Reports	
6:15 – 6:35 p.m.	GWAC Timeline Status	
6:35 – 6:45 p.m.	Status of Groundwater Monitoring System Design	
6:45 – 6:50 p.m.	Committee Business	Approve February 19 meeting summary
6:50 – 6:55 p.m.	GWAC Member Comments	
6:55 – 7:00 p.m.	Public Comment	
7:00 p.m.	Adjourn	

Next Meeting: Thursday, June 18, 2015

Committee Members

Stuart Turner, agronomist, Chelsea Durfey (alternate)	Turner and Co.
Bud Rogers, Kathleen Rogers (alternate)	Lower Valley Community Representative Position 1
Patricia Newhouse, Sue Wedam	Lower Valley Community Representative Position 2

(alternate)	
Doug Simpson	Irrigated Crop Producer
Dr. Jessica Black	Heritage University
Jean Mendoza, Eric Anderson (alternate)	Friends of Toppenish Creek
Jan Whitefoot, Jim Dyjak (alternate)	Concerned Citizens of the Yakama Reservation
Steve George, Frank Lyall (alternate)	Yakima County Farm Bureau
Jason Sheehan, Dan DeGroot (alternate)	Yakima Dairy Federation
Jim Trull, Ron Cowin (alternate)	Sunnyside-Roza Joint Board of Control
Laurie Crowe, Jim Newhouse (alternate)	South Yakima Conservation District
Robert Farrell, John Van Wingerden (alternate)	Port of Sunnyside
Rand Elliott, Vern Redifer (alternate)	Yakima County Commission
Ryan Ibach	Yakima Health District
Dr. Troy Peters	WSU Irrigated Agriculture Research and Extension Center
Bill Dunbar, Marie Jennings (alternate)	U.S. Environmental Protection Agency
Elizabeth Sanchey, Tom Ring (alternate)	Yakama Nation
Kirk Cook, Virginia "Ginny" Prest (alternate)	Washington Department of Agriculture
Andy Cervantes, Ginny Stern (alternate)	Washington Department of Health
Charlie McKinney, Tom Tebb (alternate)	Washington Department of Ecology
Lino Guerra, Rick Perez (alternate)	Hispanic Community Representative

Committee Ground Rules:

- Come to committee meetings prepared
- Treat one another with civility
- Respect each other's perspectives
- Listen actively
- Participate actively
- Honor time frames
- Silence electronic devices during meetings
- Speak from interests, not positions.

2015 Meeting Dates:

February 19	June 18	October 15
April 16	August 20	December 17 (TBD)

Meeting Materials:

Name	Date Provided	From
2015_0219_mtg 1_DraftMtgSummary_v1.doc	3/4/15	lisa.freund@co.yakima.wa.us
2015_0416_Mtg2_Agenda.docx	4/10 /15	lisa.freund@co.yakima.wa.us
2015_0304 EPO meeting summary FINAL	4/10 /15	lisa.freund@co.yakima.wa.us
2015_0219 Regulatory Framework Study Session #1 FINAL	4/10 /15	lisa.freund@co.yakima.wa.us
2015_0226 Regulatory Framework Working Group Report FINAL	4/10 /15	lisa.freund@co.yakima.wa.us
2015_0225 Data Working Group Report FINAL	4/10 /15	lisa.freund@co.yakima.wa.us
2015_0326 RCIM Working Group Report FINAL	4/10 /15	lisa.freund@co.yakima.wa.us
GWAC Timeline	4/10/15	lisa.freund@co.yakima.wa.us
2015-ltr 1 well survey_satisfactory N results	4/14/15	lisa.freund@co.yakima.wa.us
DOH private wells and QA coliform handouts (English and Spanish)	4/14/15	lisa.freund@co.yakima.wa.us

YAKIMA VALLEY GROUNDWATER MANAGEMENT AREA ADVISORY COMMITTEE (GWAC)

MEETING SUMMARY

Thursday, June 18, 2015 – 5:00 p.m. – 7:00 p.m.

KDNA Conference Rooms 1 & 2
121 S. Sunnyside Ave., Granger, WA

Note: This document is only a summary of issues and actions of this meeting. It is not intended to be a transcription of the meeting, but an overview of points raised and responses from Yakima County and Groundwater Advisory Committee members. It may not fully represent the ideas discussed or opinions given. Examination of this document cannot equal or replace attendance.

I. Call to Order

Roll Call: This meeting was called to order at 5:01 p.m. by Jim Davenport, Facilitator.

Member	Seat	Present	Absent
Stuart Turner	Agronomist, Turner and Co.,	✓	
Chelsea Durfey			✓
Bud Rogers	Lower Valley Community Representative Position 1	✓	
Kathleen Rogers	Lower Valley Community Representative Position 1 (alternate)	✓	
Patricia Newhouse	Lower Valley Community Representative Position 2	✓	
Sue Wedam	Lower Valley Community Representative Position 2 (alternate)		✓
Doug Simpson	Irrigated Crop Producer		✓
Jean Mendoza	Friends of Toppenish Creek	✓	
Eric Anderson	Friends of Toppenish Creek (alternate)		✓
Jan Whitefoot	Concerned Citizens of the Yakama Reservation		✓
Jim Dyjak	Concerned Citizens of the Yakama Reservation (alternate)	✓	
Steve George	Yakima County Farm Bureau	✓	
Frank Lyall	Yakima County Farm Bureau (alternate)	✓	
Jason Sheehan	Yakima Dairy Federation	✓	
Dan DeGroot	Yakima Dairy Federation (alternate)	✓	

Jim Trull	Roza-Sunnyside Joint Board of Control	✓	
Ron Cowin	Roza-Sunnyside Joint Board of Control (alternate)		✓
Laurie Crowe	South Yakima Conservation District	✓	
Jim Newhouse	South Yakima Conservation District (alternate)		✓
Robert Farrell	Port of Sunnyside	✓	
John Van Wingerden	Port of Sunnyside (alternate)		✓
Rand Elliott	Yakima County Board of Commissioners		✓
Vern Redifer	Yakima County Board of Commissioners (alternate)	✓	
Ryan Ibach	Yakima Health District	✓	
Dr. Troy Peters	WSU Irrigated Agriculture Research and Extension Center	✓	
Bill Dunbar	U.S. Environmental Protection Agency	✓	
Marie Jennings	U.S. Environmental Protection Agency (alternate)		✓
Elizabeth Sanchey	Yakama Nation	✓	
Tom Ring	Yakama Nation (alternate)		✓
Kirk Cook	WA Department of Agriculture	✓	
Virginia "Ginny" Prest	WA Department of Agriculture (alternate)		✓
Andy Cervantes	WA Department of Health	✓	
Ginny Stern	WA Department of Health (alternate)		✓
Charlie McKinney	WA Department of Ecology	✓	
Tom Tebb	WA Department of Ecology (alternate)		✓
Lino Guerra	Hispanic Community Representative		✓
Rick Perez	Hispanic Community Representative (alternate)		✓
Jessica Black	Heritage University		✓

II. Welcome & Meeting Overview

Quorum was met as 16 members were present.

Introductions were done.

The agenda was reviewed. The question was raised regarding how items are set on Agenda. Jim stated that it would be discussed after the presentation on the Lower Yakima Valley Groundwater Management Program.

Moment of Silence

III. Working Group Reports:

Data Working Group – Kirk Cook

The Data Collection working group met twice since the last meeting. The group has been working on the RCIM component of the nitrogen loading assessment assisted by Yakima County GIS. GIS Director Mike Martian and staff member Cynthia Kozma presented maps that identified septic systems in the Lower Yakima Valley. The ultimate goal is to identify nitrogen loading from that source. Mike explained that the data they're using for the map overlays is largely derived from the public domain (e.g., septic system numbers, fertilization rates). They are using local census data for household numbers (3.8 persons per household). In addition, they are assisting the RCIM identify lawn fertilization rates. Mike explained that GIS is using Melanie Redding's published model to develop the component.

Kirk Cook provided the members with the handout of his presentation "Preliminary Evaluation of Livestock Facility Contribution to Nitrate Levels in Groundwater – Yakima GWMA." The Data Collection and Livestock/CAFO working groups are discussing the concept and methodology for estimating nitrogen loading from lagoons/ponds and nitrogen contributions from livestock corrals/pens. 230 lagoons and ponds and 120 corrals, pens and compost facilities have been identified in the Lower Yakima Valley GWMA.

Kirk advised the group that he is seeking local, defensible data from local lagoons. The identity of the lagoons is not important, just verification that the data is from within the GWMA. He noted that all data will be verified.

There are three methodologies under consideration to estimate nitrogen loading from lagoons and ponds: 1. UC Davis – generally the most rudimentary approach of the three methodologies. Aside from surface area, all other data is derived from other sources. 2. USGS/Ecology – Has more input parameters than the UC Davis approach, but still relies on assumptions and other publications. 3. Darcy's equation – relies on much more local data to derive loading estimates than the other two options. The Darcy analysis is a calculation based on specific lagoon area, liner permeability, underlying soil permeability, local nitrate content of lagoon/pond material and depth of the lagoon/pond.

In response to a question about David Erickson's methodology, Kirk replied that it is basically the same as Darcy's equation. Erickson's methodology will be presented at the next joint

meeting. The Data Collection working group hopes to reach agreement on a methodology by mid-July with loading analysis targeted for late July.

Data Collection will hold its next joint meeting with the Livestock/CAFO working group on Thursday, June 25, 2015.

Livestock/CAFO Working Group –
Charlie McKinney

The Livestock/CAFO Working group has met twice. One of the meetings was the joint session with the Data Collection working group on June 11. Charlie agreed to develop a list of variables on estimating nitrate contribution from livestock corrals/pens for the upcoming meeting on June 25, 2015. The group needs to take a concentrated look at how to come up with numbers.

Irrigated Ag Working Group – Jim Trull

Jim Trull reported the group has been discussing four key points: 1. Round two of deep soil sampling – 48 fields have been sampled (33 fields were sampled in Round 1). The group is putting data together to measure nutrients. 2. Best Management Practices (BMPs) – the group identified those BMPs positively impacting the reduction of nitrates reaching the groundwater. The group concluded that each of these BMPs needs a brief summary to further define and clarify the practice. 3. Irrigation Water Management – the group discussed the need for data on the problem of over-irrigation and the resultant leaching of nitrates below the root zone. 4. Nutrient Management – the group will be brainstorming options on what needs to improve and possible incentives to get participation.

RCIM Working Group – Robert Farrell

Robert Farrell reported the group is working on nitrate loading from residential farms and hobby farms. The group is scheduled to meet next week.

Education and Public Outreach (EPO) Working Group – Lisa Freund

Lisa Freund reported the EPO Working Group is launching Phase II of the high risk well assessment surveys. In Phase I, 172 households participated. The group is hoping to get 300

participants in Phase II. The same methodology will be used for Phase II that was used for Phase 1. As such, areas of known high nitrates will be targeted as well as areas with little nitrate data. Properties immediately outside the recently expanded EPA consent boundaries will be included in the targeting. The mailing list for households will be increased from 600 in Phase 1 to 1,000 in Phase II. Outreach will start in August and will include direct mailing, radio, flyers, community events, newspaper, etc. Please encourage participation.

Regulatory Framework Working Group – Patricia Newhouse

Patricia Newhouse reported that Jean Mendoza was voted Chair of the group at the April 2nd meeting. The group discussed ground rules on how it would function and who could participate, timeline for study sessions, goals and objectives, what the final product will look like and who they needed to hear from in order to evaluate the regulatory and non-regulatory programs. On April 23 the group had a presentation from Bonda Habets who provided a broad overview of the USDA Natural Resources Conservation Service (NRCS). At the third meeting on June 10, 2015, the group heard a presentation from Laurie Crowe with the South Yakima Conservation District who provided an overview of Conservation Districts' history, origins, governing board, duties, funding and responsibilities. Ginny Prest, Washington State Department of Agriculture (WSDA) also made a presentation to the group on Dairy Nutrient Management Plans (DNMP). The group will meet on August 12 to continue the question and answer session with Ginny.

IV. Lower Yakima Valley Grounwater Management Program: Jim Davenport

Jim Davenport presented the group with the draft Lower Yakima Valley Groundwater Management Program table of contents. Work on the first section, "Charterization of the Area," has begun. They are already beginning to develop the characterization plates, which contain the same information that Mike Martian provided earlier this evening. GIS already has some data in the form of elevation, zoning, geology, and USGS layers of groundwater. When put together, the plates illustrate what the group needs in order to put the GWMA plan together.

As sections of the plan are completed they will be brought to the GWAC for review and input. The plan is to have the first section completed by September.

Action: Jim requested feedback on the table of contents within a week to 10 days (June 28). Lisa Freund will email the table of contents to members. [Editorial note: the table of contents was emailed to the GWAC on 6/15/15]. Tabbed binders will be distributed at the August meeting for the forthcoming sections of the plan.

V. GWAC Member Comments

A member asked how items get placed on the GWAC Agenda: who decides? Vern Redifer replied that Yakima County as lead agency sets the Agenda. Outside presentations will be evaluated in the future and if the presentation may be of sensitve nature, the group will be contacted for input.

Reminder: All correspondence, including email are public domain. Please be courteous.

VI. Public Comment:

Frank Lyall addressed an earlier comment made regarding larger farms have better practices [than small farms]. This is an untrue and unfair statement.

VII. Next Steps:

- Members will provide Jim Davenport with feedback on the draft GWMA Plan Table of Contents by June 28.
- Members with access to local lagoon data are asked to provide it to Kirk Cook.

Next Meeting:

- August 20, 2015 5:00 PM
  Location: Radio KDNA, 121 Sunnyside Ave, Granger, WA 98932

2015 Meeting Calendar

October 15, 2015
December 17, 2015 (tentative, if needed)

The meeting was adjourned at 7:06 p.m.

Meeting summary approved by the GWAC on _____.

Affidavit of Publication

STATE OF WASHINGTON
COUNTY OF YAKIMA SS

Timothy J. Graff, being first duly sworn on oath deposes and says that he is the Publisher of the *DAILY SUN NEWS, a daily newspaper.*

That *said newspaper* is a legal newspaper and it is now and has been for more than six months prior to the date of publications hereinafter referred to, published in the English language continually as a daily newspaper in the city of Sunnyside, YAKIMA County, Washington, and it is now and during all of said time printed in an office maintained at the afforesaid place of publication of said newspaper, and that the said Daily Sun News was on the 4th Day of April, 1969 approved as a legal newspaper by the Superior Court of said Yakima County.

That the annexed is a true copy of a LEGAL PUBLICATION -
Yakima County Public Services
Groundwater Mtg 6-18-15
published in regular issues (and not in supplemental forms) of said newspaper once each week for a period of 1 consecutive issue(s) commencing 06/11/15 and ending on 06/11/15, both dates inclusive, and that such newspaper was regularly distributed to its subscribers during all of said period. That the full amount of the fee charged for the foregoing publication is the sum of $ 33.75, amount has been paid in full, at the rate of $7.50 per column inch per insertion.

Subscribed and sworn to before me 06/11/15

Notary Public in and for
the State of Washington
030110-00000

MARNIE C GIBBS
NOTARY PUBLIC
STATE OF WASHINGTON
COMMISSION EXPIRES
NOVEMBER 15, 2017

Notice of Public Meeting
Lower Yakima Valley Groundwater Advisory Committee

NOTICE IS HEREBY GIVEN that Yakima County is holding a public *meeting of the Lower Yakima Valley* Groundwater Advisory Committee on Thursday, June 18, 2015 at 5:00 PM at Radio KDNA Conference rooms 1 & 2, 121 Sunnyside Ave., Granger, WA 98932 *pursuant* to Chapter 173-100-080 WAC Ground Water Management Areas and Programs.

For Additional Information

To learn more about the Lower Yakima Valley Groundwater Management Area, the Groundwater Advisory Committee, and its goals and objectives, please see the Lower Yakima Valley Groundwater Management Area on the County webpage at: http://www.yakima*county.us/gwma/*

For more information about the meeting, please contact Lisa Freund, Yakima County Public Services Administrative Manager at *574-2300.*

Dated this Wed., June 10, 2015
PUBLISH: DAILY SUN NEWS
June 11, 2015

YAKIMA HERALD REPUBLIC

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Please confirm placement prior to deadline, by contacting your account rep at (509) 577-7740.

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Account #:	110536
Company Name:	YAKIMA COUNTY SURFACE WATER MANAGEMENT
Contact:	Tina Beck,AP
Address:	128 NORTH 2ND STREET ROOM 408 YAKIMA, WA 98901
Telephone:	(509) 574-2343

Ad ID:	552974
Start:	06/11/15
Stop:	06/11/15
Total Cost:	$67.70
# of Inserts:	2
Lines:	41.0
Ad Class:	6021
Ad Class Name:	Legal Notices
Account Rep:	Simon Sizer
Phone #	(509) 577-7740
Email:	ssizer@yakimaherald.com

Run Dates:
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YakimaHerald.com 06/11/15

Ad Proof

Yakima County

Notice of Public Meeting Lower Yakima Valley Groundwater Advisory Committee

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For Additional Information
To learn more about the Lower Yakima Valley Groundwater Management Area, the Groundwater Advisory Committee, and its goals and objectives, please see the Lower Yakima Valley Groundwater Management Area on the County webpage at: http://www.yakimacounty.us/gwma/

For more information about the meeting, please contact Lisa Freund, Yakima County Public Services Administrative Manager at 574-2300.
Dated this **Wednesday, June 10, 2015**

(552974) June 11, 2015

LOWER YAKIMA VALLEY

GROUNDWATER ADVISORY COMMITTEE

Groundwater Management Area (GWMA):
The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards

Meeting Time and Location

Thursday, June 18, 2015, 5:00 - 7:00 p.m.

Radio KDNA
121 Sunnyside Ave.
Granger, WA 98932

Regular GWAC Meeting

Agenda – REVISED 6/15/15

Time	Topic	
5:00 – 5:10 p.m.	Welcome & Meeting Overview	
5:10 – 6:25 p.m.	Working Group Reports • Data Collection ○ Nitrogen Loading Assessment • EPO • Livestock/CAFO • IAWG • RCIM • Regulatory Framework	 Lee Murdock Kirk Cook Lisa Freund Charlie McKinney Jim Trull Bob Farrell Jean Mendoza
6:25 – 6:40 p.m.	Lower Yakima Valley Groundwater Management Program	Jim Davenport
6:40 – 6:50 p.m.	Committee Business	Approve April 16 meeting summary
6:50 – 6:55 p.m.	GWAC Member Comments	
6:55 – 7:00 p.m.	Public Comment	
7:00 p.m.	Adjourn	

Next Meeting: Thursday, August 20, 2015

Committee Members

Stuart Turner, agronomist, Chelsea Durfey (alternate)	Turner and Co.
Bud Rogers, Kathleen Rogers (alternate)	Lower Valley Community Representative Position 1
Patricia Newhouse, Sue Wedam (alternate)	Lower Valley Community Representative Position 2
Doug Simpson	Irrigated Crop Producer
Dr. Jessica Black	Heritage University
Jean Mendoza, Eric Anderson (alternate)	Friends of Toppenish Creek
Jan Whitefoot, Jim Dyjak (alternate)	Concerned Citizens of the Yakama Reservation
Steve George, Frank Lyall (alternate)	Yakima County Farm Bureau
Jason Sheehan, Dan DeGroot (alternate)	Yakima Dairy Federation
Jim Trull, Ron Cowin (alternate)	Sunnyside-Roza Joint Board of Control
Laurie Crowe, Jim Newhouse (alternate)	South Yakima Conservation District
Robert Farrell, John Van Wingerden (alternate)	Port of Sunnyside
Rand Elliott, Vern Redifer (alternate)	Yakima County Commission
Ryan Ibach	Yakima Health District
Dr. Troy Peters	WSU Irrigated Agriculture Research and Extension Center
Bill Dunbar, Marie Jennings (alternate)	U.S. Environmental Protection Agency
Elizabeth Sanchey, Tom Ring (alternate)	Yakama Nation
Kirk Cook, Virginia "Ginny" Prest (alternate)	Washington Department of Agriculture
Andy Cervantes, Ginny Stern (alternate)	Washington Department of Health
Charlie McKinney, Tom Tebb (alternate)	Washington Department of Ecology
Lino Guerra, Rick Perez (alternate)	Hispanic Community Representative

Committee Ground Rules:

- Come to committee meetings prepared
- Treat one another with civility
- Respect each other's perspectives
- Listen actively

- Participate actively
- Honor time frames
- Silence electronic devices during meetings
- Speak from interests, not positions.

2015 Meeting Dates:

February 19 April 16	June 18 August 20	October 15 December 17 (TBD)

Meeting Materials:

Name	Date Provided	From
2015_0416_GWAC_DraftMeetingSummary_v3.docx	5/1/2015	lisa.freund@co.yakima.wa.us
~~2015_0618_Mtg3_Agenda.docx~~	~~6/11/15~~	~~lisa.freund@co.yakima.wa.us~~
Revised Agenda - 6/15/15	6/15/15	lisa.freund@co.yakima.wa.us
Data Collection Working Group Reports of April 9 & May 19, 2015	6/11 & 6/15/15	lisa.freund@co.yakima.wa.us
EPO Working Group Reports of May 6 & June 3, 2015	6/11/15	lisa.freund@co.yakima.wa.us
Livestock/CAFO Working Group Report of April 9, 2015	6/15/15	lisa.freund@co.yakima.wa.us
IAWG Working Group Report of April 6, 2015	6/15/15	lisa.freund@co.yakima.wa.us
RCIM Working Group Report of April 30, 2015	6/11/15	lisa.freund@co.yakima.wa.us
Regulatory Framework Reports of April 2, April 23 and May 13, 2015	6/11 & 6/15/15	lisa.freund@co.yakima.wa.us
Lower Yakima Valley Groundwater Management Program	6/15/15	lisa.freund@co.yakima.wa.us
Preliminary Evaluation of Livestock Facility Contribution to Nitrate Levels in Groundwater	6/15/15	lisa.freund@co.yakima.wa.us

Education and Public Outreach

Charge from Groundwater Management Area Advisory Committee

Working Group Members

Andres Cervantes (GWAC-DOH), Jean Mendoza (GWAC-Friends of Toppenish Creek), Tom Tebb (GWAC-Ecology), Elizabeth Torres (Citizen), Gretchen Stewart (EPA), Nieves Negrete (Citizen), Patricia Newhouse (GWAC-Citizen Rep Position #2), Dean Effler (Citizen), Joye Redfield Wilder (Ecology), Stuart Turner (GWAC-Turner & Company), Ignacio Marquez (AGR)

Meetings/Calls Dates

Meeting: Wednesday, May 6, 2015 from 1:30 p.m.to 3:30 p.m.

Participants

Lisa Freund (Chair-Yakima County), *Andres Cervantes (GWAC), Gretchen Stewart (EPA), Jean Mendoza (GWAC), Jim Davenport (Yakima County) Jim Dyjak (GWAC), Joye Redfield Wilder (Ecology), Lee Murdock (Yakima County), Patricia Newhouse (GWAC)

*via phone

Key Discussion Points

- **EPO Achievements**

  Lisa reviewed EPO's achievements from 2012 to present. The most recent accomplishment is communications back to the 2014 high risk well assessment participants. 171 unique letters and educational materials will be mailed to the survey participants this week. The purpose of the mailing is to provide participants with their well sampling results, provide well testing resources and to ask them to invite their neighbors and friends to participate in the second round of well sampling.

  Joye suggested creating and issuing a news release announcing the release of the results. The release will be issued concurrently with the mail drop. The group agreed.

  Lisa noted that all EPO's materials, with the exception of web postings, have been produced and distributed in English and Spanish. A member asked if the PowerPoint presentations posted on the web ("train the trainer" materials) had been translated into Spanish. Lisa responded not yet; however, with the update of the website, Spanish-language web access will be addressed.

  Gretchen Stewart was asked to provide details on the PEHSU partnership and the number of clinicians (48) who have been trained. She noted that the next assignment was to complete the New Mom photo novella, in response to Yakima Valley Memorial Hospital's

(YVMH) request for simpler materials. The goal is to complete the novella by September. She added that 2000 new mom flyers have been distributed to the hospitals, with YVMH requesting additional copies.

Jim Davenport asked if there was a means to calculate the effectiveness of PEHSU's campaign. Gretchen replied no, not yet. Nor has "Blue Baby" been recognized by the state as a reportable condition. She observed that medical schools do not provide environmental training to their students.

A member asked if coliform trends from the high risk well assessment survey could be identified. In response, Lee reminded the group that the sample size – 171 – was too small to draw meaningful results. The GWAC approved the second phase of high risk well assessment surveying in part to obtain a larger (meaningful) sampling.

- **EPO Outreach Plan**

Lisa noted that it is time to revisit the plan, which had an anticipated completion date of 2014. The EPO would be well served to validate the audiences and messages it identified in 2012, and use that validation to develop a communications plan that would guide its 2015-16 educational campaigns.

Using the Outreach Plan's audiences as a starting point, Lee walked the group through an exercise to affirm the outreach plan audiences and to set the stage for a communications plan. The plan would use the Outreach Plan as its source document, expand it, and provide a more structured task list for various outreach campaigns.

A broad discussion ensued regarding which audiences the EPO should target. For example, should the general public throughout Yakima County be aware of the GWMA activities. Jim Davenport replied that yes, if the County Commission is asked to take action on a controversial GWAC decision, it will go before the entire County.

Jim asked about the purpose of reducing the audience list to smaller categories. Lee explained that the purpose is not just to consolidate a list: the purpose is to determine if it is realistic.

Lee volunteered to complete the targeted audience exercise and email it to the EPO for its review. The group accepted her offer.

2015 EPO Campaigns

Gretchen Stewart stated that she had volunteered to lead the effort to create the EPO's 2015-2016 outreach campaign. The outreach campaign will be a "boots on the ground" effort that will identify how the $56,000 budget approved by the GWAC will be spent. It will use the EPO's guiding documents (i.e., Outreach Plan and Communications Plan) to take the EPO's strategy to the next level. Gretchen called for up to five volunteers to participate in an EPO ad hoc committee that will prioritize the targeted audiences, identify the key messages, and identify deadlines and vehicles to carry out the 2015-16 campaigns. Her goal is to have a marketing plan in place by September.

Ignacio Marquez, Patricia Newhouse and Lee Murdock volunteered for the ad hoc group.

Lee volunteered to create the draft communications plan by the end of May for Gretchen's group's consideration. The group accepted her offer.

The point was raised that the EPO needs to prepare for outreach implementation that will continue after the GWAC has completed its work. Jim observed that prevention is the ultimate goal: people's behaviors will need to change in order to improve groundwater quality. EPO will have a role in that work.

GWMA Website Update

Lee reported that the work is continuing as outlined previously.

Resources Requested

- None

Recommendations for GWAC

Deliverables/Products Status

- Lee will create a draft Communications Plan for Gretchen's ad hoc committee's review by the end of May.
- Lisa will draft a high risk well survey results news release to be released in conjunction with the participants' mailing.

Proposed Next Steps

Gretchen will convene the first meeting of the ad hoc campaign group the first week of June in Yakima.

Next meeting: Wednesday, June 3, 2015, from 1:30 p.m.-3:30 p.m., Yakima County Courthouse Rm 419

[Education and Public Outreach]

Charge from Groundwater Management Area Advisory Committee

Working Group Members

Andres Cervantes (GWAC-DOH), Jean Mendoza (GWAC-Friends of Toppenish Creek), Tom Tebb (GWAC-Ecology), Elizabeth Torres (Citizen), Gretchen Stewart (EPA), Nieves Negrete (Citizen), Patricia Newhouse (GWAC-Citizen Rep Position #2), Dean Effler (Citizen), Joye Redfield-Wilder (Ecology), Stuart Turner (GWAC-Turner & Co), Ignacio Marquez (AGR); Lisa Freund (Yakima County-Chair)

Meetings/Calls Dates

Meeting: Wednesday, June 3, 2015 from 1:30 p.m. to 3:30 p.m.

Participants

Lisa Freund (Chair-Yakima County), Andres Cervantes (GWAC), Jean Mendoza (GWAC), Joye Redfield Wilder (Ecology), Lee Murdock (Yakima County), Ignacio Marquez (AGR), Patricia Newhouse (GWAC), *Gretchen Stewart (EPA), Karri Espinoza (Yakima County)

**Via phone*

Key Discussion Points

- **Phase II High Risk Well Assessment Survey**

Lisa reviewed Phase 1 of the GWMA High Well Assessment Survey: budget, targeted areas, messaging, outreach and lessons learned. The group discussed how Phase I can inform and guide Phase 2, slated to begin later this year.

Lisa reminded the group that the purpose of the well assessment surveys is to educate private well owners about their wells, the GWMA and the GWAC; to collect data on wellhead conditions and to gauge interest in long-term well monitoring.

Lee recommended that the Phase II methodology replicate the work of Phase 1, observing that for purposes of data collection and analysis it is better to maintain consistency across the surveys.

A broad ranging discussion ensued, including data sources used to identify the high/no data nitrate areas, whether the group should consider print advertisements (newspaper) in phase 2, and the possibility of conducting outreach to Lower Yakima Valley schools—either by offering print materials or educational presentations.

Lee noted that there are shortcuts the group can employ to distribute information: ESD 105, the Mid-Valley Consortium (nonprofits) STEM leadership team, Yakima Valley Farmworkers Clinics and similar.

The group agreed by consensus to replicate the Phase I methodology in Phase II. Accordingly, areas of known high nitrates will be targeted as well as areas with little Nitrate data. Properties immediately outside the recently-expanded EPA consent boundaries will be included in the targeting.

The group further agreed to expand the direct mail list from the 600 households in Phase 1 to 1,000 in Phase II. The outreach strategy will also replicate Phase 1 with a start date of August 2015.

Direct Mail – Early August

Radio Ads – Mid August

Talk Radio – Late August

ACTIONS: Joye will send Andy the link to the 2003 Well Assessment study.

Andy will review the data and see what information may be helpful in Phase II.

Lisa will send all the Phase I outreach materials to the group, and will develop a draft timeline of Phase II's launch.

The group will review the materials, affirm key messages and provide additional suggestions to Lisa before the July 1st meeting.

The group will also review the draft timeline and be prepared to finalize it at the July meeting.

- **GWMA Web Update**

Lee shared the City of South San Francisco website, walking through the modules that the GWMA may choose to use (Agenda Center, Calendar Center, document center, etc.) when the website is revamped. She explained the Community Partnership section, noting that the GWMA web pages will be located in that section, with a separate identity from the Yakima County site.

She explained features that will allow the public to sign up for notification of changes to the GWMA calendar, and allow for personal e-mail updates when meetings are posted and/or changes are made.

A member expressed concern that the site would not be helpful to her constituents-- non-English speakers, the illiterate, the homeless. The EPO has done nothing to inform or educate those target audiences.

In response, Lisa asked Gretchen Stewart to review the University of Washington and PEHSU's 15-month partnership with EPO to reach new moms. Gretchen reviewed the materials that have been developed to reach new moms and their healthcare providers (PEHSU Fact Sheet, New Mom Fact Sheet, clinician training materials). PEHSU has conducted local trainings with medical providers at Farmworker Clinic, Yakima Valley Memorial Hospital. Gretchen reminded the group that she is working with PEHSU and Yakima Valley Memorial Hospital to develop a new mom photo novella, to address new moms and families with low literacy skills. She added that the Yakima Health District now recognizes methemoglobinemia as a reportable disease; however, the state of Washington still does not.

Gretchen also reminded the group that she is forming an Ad-hoc committee that will meet the first week of July to strategize on more ways to educate the hard to reach audiences. She asked the group to let her or Lisa know if they are interested in joining this committee.

Resources Requested

- None

Recommendations for GWAC

- None

Deliverables/Products Status

- Lisa will send all the materials developed for the High Risk Well Assessment Phase 1. Based on today's discussion, she will develop and distribute a draft timeline for the Phase II launch.

Proposed Next Steps

- Next EPO meeting: Wednesday, July 1, 2015 from 1:30 p.m. – 3:30 p.m., Yakima County Courthouse Rm 419
- The ad hoc marketing committee is tentatively scheduled to meet the week of July 6 in Yakima. If interested, contact Gretchen or Lisa F to participate.

Livestock/CAFO Working Group

Charge from Groundwater Management Area Advisory Committee

Discussion of data sources and remaining Work Plan Items

Working Group Members

Charlie McKinney, Chair (Department of Ecology), Kirk Cook (Department of Agriculture), Elizabeth Sanchey (Yakama Nation), Jason Sheehan (Dairy Federation), Jim Newhouse (South Yakima Conservation District), Laurie Crowe (South Yakima Conservation District), Sue Wedam (LV Community Rep.), Patricia Newhouse (Community Rep Position #2), Steve George (Yakima County Farm Bureau), Stuart Turner (Turner & Co., Inc.), Jean Mendoza (Friends of Toppenish Creek), Jim Dyjak (Concerned Citizens of the Yakama reservation)

Meetings/Calls Dates

Meeting: Thursday, April 9, 2015 5:00 – 7:00 pm

Participants

Charlie McKinney (Dept. of Ecology), Sue Wedam (LV Community Rep.), Jean Mendoza (FOTC), Jason Sheehan (Dairy Fed.), Jim Davenport (for Yakima Co.), Larry Fendell, (Public), Steve George (Yakima County Farm Bureau), Stuart Turner (Turner & Co., Inc.), Jim Dyjak (Concerned Citizens of the Yakama Reservation), Lino Guerra (Hispanic Community Representative)

Key Discussion Points

Welcome and Meeting Overview: Charlie McKinney welcomed the group and reviewed the agenda for the evening, stating that the order of the agenda will be changed, moving the review of the GWMA Project Timeline to the end.

Charlie shared with the group the information Kirk Cook provided at the Data Working Group meeting which was held earlier in the day. Kirk spoke of the Nitrogen Loading Study and how the work of this Livestock/CAFO group will help inform the study. This study will start with the animal/dairy assessments looking at lagoons, pens and storage areas. They will look at the size of the areas with aerial photography and determine calculations from that information. Stuart Turner offered additional information about the assessments stating that assessments have already started and will continue until every dairy in the GWMA area has been assessed. The assessors will be walking the perimeter gathering a great amount of details noting pipes, erosion, concrete, etc. This on-site information will be combined with aerial photography to determine sizes and basic characteristics.

After a discussion about what this Working Group as a whole is able to offer information on, it was determined that it would be best to look into hiring a technical expert to conduct the literature review and to help assess the data to determine what is most relevant. The group agreed that there is not enough time at this point to review studies and come up with the most accurate

factors for the Nitrogen Loading Study. It would be beneficial to hire an expert and have a session with him where this group can meet and review and ask questions of the expert to make sure they are pulling all the relevant information that will best fit this region.

Action: Members are to submit to Charlie a list of names and qualifications of the experts they feel would be good to seek further technical information from by Friday, April 17, 2015. This list of names will be discussed and narrowed down at the next monthly meeting. The working group would like to identify the best candidate and forward their recommendation for the GWAC's consideration at its June meeting.

Review of GWMA Project Timeline:

Problem Definition/Nitrogen Loading Lines 104 and 105:

The group recommended extending the deadlines for 6.1 - Conduct literature review and 6.2 - Conduct evaluation of manure generation - to the first quarter of 2016.

The group also recommended extending the deadline for Developing [the] Nitrogen Loading Estimate for Livestock Properties (line 115) –to January 1, 2016.

In looking at the requirements for the timeline, it appears that once the working group has met with an expert they will have a better ability to prepare information needed.

Miscellaneous:

Jim Dyjak requested that emails be sent out well in advance (not same day as the meeting) as many people are in the field that day and won't have time to see or review the notes before the meeting.

Resources Requested

None at this time. Budget requests may ultimately be submitted to cover cost of hiring an expert for a day study session.

Recommendations for GWAC

None at this time.

Deliverables/Products Status

Proposed Next Steps

Next meeting: Thursday, May 7, 2015, 5:00 PM-7:00 PM at Radio KDNA in Granger - POSTPONED

Irrigated Ag Working Group (IAWG)

Charge from Groundwater Management Area Advisory Committee

Working Group Members

Jim Trull (Roza-Sunnyside Joint Board of Control), Dr. Troy Peters (WSU), Jean Mendoza (friends of Toppenish Creek), , Ralph Fisher (EPA), Ron Cowin (SVID), Stuart Turner (Turner & Co.), Tom Tebb (Department of Ecology), Ginny Prest (Dept. of Ag), Laurie Crowe (South Yakima Conservation District), Dave Fraser (Simplot Agronomist), Scott Stephen (Citizen), Donald Jameson (Citizen), Mike Shuttleworth (Citizen), Chelsea Durfey (Citizen), Doug Simpson (Farmer), Rosalio Brambila (Farm Manager), Vern Redifer, Jim Davenport

Meetings/Calls Dates

Meeting: Sunnyside Valley Irrigation District Office, 120 S. Eleventh Street, Sunnyside

When: April 6, 2015 from 1:30 pm to 3:30 pm.

Call: (509) 574-2353 – Pin # 2353

Participants

Jim Trull (Chair), Jean Mendoza, Doug Simpson, Stuart Turner, Laurie Crowe*, Dr. Troy Peters, Scott Stephen, Jim Davenport, Vern Redifer, Frank Lyall, Ralph Fisher*, Lee Murdock, Greta Smith (Yakima County staff support)

*via telephone

Key Discussion Points

1. Round 2 of Deep Soil Sampling.

Laurie Crowe spoke about the 2nd round of Deep Soil Sampling (DSS). It is anticipated to start April 27th, with fifty samples to be taken, none of which are to be repeats. The focus will be on triticale, grapes, and mint. A member requested to know how many producers submitted more than one survey or sample site; Laurie will retrieve that information and submit to Jim Trull for dissemination to the group in the quarterly report. It was confirmed that the questionnaire used will be the last revision from late Fall 2014.

ACTION: Jim Trull will collect information regarding the number of surveys per producers and include in the quarterly report.

2. Review of Parameters for Deep Soil Sampling.

To ensure everyone was on the same page, Jim Trull reiterated the statement "These rooting depth categories include less than 2.3 feet, 2.5 up to 4 feet and more than 4 feet."

The discussion around Deep Soil Sampling (DSS) leaned toward the complexity of the sampling with crop type, root depth, soil conditions and crop rotations being variables that will affect the sampling. It was suggested that a large data set will produce the best results.

It was also discussed that one of the outcomes of the DSS was that informed producers were changing their practices once informed of the results. The question of outreach was discussed. The best method of outreach for DSS participation may be producers talking to other producers about the individual benefit of being a participant of the DSS project. Dissemination of the data with the potential to impact farming practices will take a different type of outreach. No conclusions were reached on that subject.

3. Review of GWMA Plan Timeline

Vern Redifer stated that the GWMA Plan timeline is intended to identify what specific tasks needed to be completed and in what order in relation to WAC 173.100.100. He also mentioned that many of these tasks are dependent on each other. This information is adaptable and he is looking for suggestions from each Working Group, thinking about what is being done, what still needs to be done and the timeframe

There was discussion focusing on conducting additional monitoring around water management, but it was determined that it is too late to start that process as irrigation has already started.

ACTION: The members to review the timeline and give input.

4. Proposal for additional work on Best Management Practices (BMP's).

Jim Trull corrected the Agenda, stating that TMDLS should be BMP's. He requested that this working group look at the list of BMPs that was distributed and narrow it down for the implementation phase. He would like to shorten the list to BMP's that would best affect reducing nitrated in groundwater.

ACTION: The IAWG to review the BMP's then edit and prioritize the list.

5. Miscellaneous

There was a general discussion about the need for data on irrigation use to compliment the work on nutrient management. There was general agreement but no consensus on how to do it.

ACTION: This topic will be added as a task at a later IAWG Meeting.

Meeting was adjourned at 3:05 pm.

Resources Requested

- N/A

Recommendations for GWAC

- N/A

Deliverables/Products Status

- N/A

Proposed Next Steps

- TBA

Irrigated Ag Working Group (IAWG)

Charge from Groundwater Management Area Advisory Committee

Working Group Members

Jim Trull (GWAC-Roza-Sunnyside Joint Board of Control), Bob Stevens (interested party) Bud Rogers (GWAC-Citizen), Chelsea Durfey (GWAC), Dan McCarty (interested party), Dave Cowan (interested party), Dave Fraser (Interested Party - Simplot Agronomist), Donald Jameson (interested party), Doug Simpson (GWAC-Farmer), Frank Lyall (GWAC-Farm Bureau), Ginny Prest (GWAC-Dept. of Ag), Jean Mendoza (GWAC-Friends of Toppenish Creek), Jim Newhouse (GWAC), Kevin Lindsey (interested party), Kirk Cook (GWAC-WSDA), Laurie Crowe (GWAC-South Yakima Conservation District), Melanie Redding (Ecology), Mike Shuttleworth (interested party), Ralph Fisher (EPA), Ron Cowin (GWAC-SVID), Scott Stephen (interested party), Stuart Turner (GWAC-Turner & Co.), Tom Tebb (GWAC-Department of Ecology), Rosalio Brambila (interested party), Dr. Troy Peters (GWAC-WSU); Vern Redifer, Jim Davenport.

Meetings/Calls Dates

Meeting: Sunnyside Valley Irrigation District Office, 120 S. Eleventh Street, Sunnyside

When: June 8, 2015 from 2:00 pm to 4:00 pm.

Call: (509) 574-2353 – Pin # 2353

Participants

Jim Trull (Chair), Ginny Prest*, Jean Mendoza, Laurie Crowe*, Ralph Fisher*, Scott Stephen, Stuart Turner, and Tom Tebb; Jim Davenport, Lisa Freund, and Greta Smith (Yakima County)

*via telephone

Key Discussion Points

1. Report on Round 2 of Deep Soil Sampling.

Laurie Crowe reported on the second round of Deep Soil Sampling (DSS). 48 fields have been sampled, with two not being completed due to time constraints around "Call Before Dig." These two fields will be completed this fall. Laurie forwarded the results and the completed questionnaires to Vern on June 4. A member inquired about the adequacy of the budget to complete the sampling. Jim stated that the budget allows for 200 tests. So far only 33 (round 1) and 48 samples (round 2) have been taken, leaving sufficient funds for 119 additional field samples. A member asked when the data would be available and if it would be available before the June 18 GWAC meeting. Jim advised that the data will come to the IAWG first if it is available before the GWAC meeting. Jim Davenport stated that Vern would get it done before the GWAC

meeting. A member asked if Bob Stevens and Troy Peters would review the data. Jim said that he would ask if they would do so and Laurie replied that the data could also be reviewed by Landau Associates at no cost. The observation was made that the data set is still too small for meaningful analysis; however, it is sufficient to make general observations.

2. Review of Best Management Practices (BMPs)

Jim Trull reported that the BMP list has been updated to include only those practices which will directly contribute to achieving the goal of reducing nitrogen contamination in the ground water. The four categories will be 1) practices which improve management of irrigation water, 2) practices which improve uniformity of application of irrigation water, *3) practices which improve handling, storage and management of agricultural and animal byproducts, 4) practices which improve planning and application of all forms of nitrogen, including agricultural and animal by productions. *It was suggested that "food processing waste" be added to number three.

The group reviewed the BMPs specifically identified as positively impacting the reduction of nitrates reaching the groundwater. The Group concluded that each of these BMPs listed will need to have a brief summary to further define and clarify the practice in 100 words or less.

ACTION: Each referenced standard will be clarified by writing a 100-word (or less) summary.

3. Irrigation Water Management

There was a general discussion about the need for data on the problem of over irrigation and the resultant leeching on nitrates below the root zone. It was agreed that there are several different tools to collect the data, but it is hard to get farmers to implement the action. The challenge of educating farmers and purveyors to implement new standards was discussed. General discussion also took place regarding data collection, education and public outreach. Jim Trull observed that an ongoing program for irrigation use will be essential. While the GWAC viewed the IAWG's mobile irrigation lab proposal to be an implementation element, the IAWG disagreed. It is essential to immediately begin to assess the efficiency of irrigation practices whether through a singular mobile lab or in component parts.

4. Nutrient Management

It was suggested that a "brainstorming" take place to get opinions on what needs to improve and possibly use incentives to get participation. Jim Davenport suggested inviting purveyors to address this group to discuss what they do, what they need, and how the IAWG can partner with them to help accomplish their goals. Jim Trull observed that that would not be a happy discussion. Tom Tebb suggested developing an incentive program for both purveyors and farmers.

5. Other Business

Jim Trull provided a draft Report to the Groundwater Advisory Committee dated June 18, 2015. The group concluded that it will need more work and is not ready for presentation at the June GWAC meeting.

Jim Trull concluded the meeting, observing that the group is still at the conceptual stage (data collection).

Meeting was adjourned at 3:32 pm.

Resources Requested

- N/A

Recommendations for GWAC

- N/A

Deliverables/Products Status

Proposed Next Steps

- The definitions of each BMP will be summarized in 100 words or less. The IAWG will then review, respond and provide suggestions in light of today's discussion.
- Jim Trull will provide a general report on IAWG's direction at the June GWAC meeting.
- A report will be presented to the GWAC at its August meeting.

Residential, Commercial, Industrial, Municipal (RCIM) Work Group

Charge from Groundwater Management Area Advisory Committee

Working Group Members

Robert Farrell, Chair (Port of Sunnyside), Elizabeth Sanchey (Yakama Nation), Ryan Ibach (Yakima Health District,) Jan Whitefoot (Concerned Citizens of Yakama Reservation,) John Van Wingerden (Port of Sunnyside,) Stuart Turner (Turner & Co.), Tom Ring (Yakama Nation), Kathleen Rogers (Citizen Rep), Sanjay Barik (Ecology,) Dan DeGroot (Yakima Dairy Federation)

Meetings/Calls Dates

Meeting: April 30, 2015 1:00 pm – 3:00 pm

Participants

Present: Robert Farrell, Chair (Port of Sunnyside), Ryan Ibach (Yakima Health District), Kathleen Rogers (Citizen Rep), Jim Davenport (Yakima County), Lisa Freund (Yakima County), Yakima County Support Staff – Greta Smith

Key Discussion Points

- **Discuss the nitrogen loadings to the aquifer from RCIM sources: i.e., Septic systems, fertilizer use and hobby farms**
- **Discuss the existing and future RCIM groundwater uses**

Bob Farrell reminded the group that septic system data will be provided by Melanie Redding, Department of Ecology, via the Data working group. The data will quantify the amount of nitrogen produced by septic systems, and how much of that source hits the groundwater. Bob also referenced "Residential Waste Discharge," (Metcalf & Eddy. 1991. *Wastewater Engineering Treatment and Reuse*, G. Tchobanoglous, F. L. Burton, McGraw Hill, New York) a source he used to identify wastewater flow rates. That document was shared with the RCIM in an email dated March 26, 2015.

Kathleen Rogers presented the information she gathered in regards to the amount of nitrogen applied each year at Sunnyside School Dist., Sunnyside Christian School, City of Sunnyside, Sunnyside Golf Courses and Cemeteries for lawn maintenance. She inquired about the number of acres covered and the type of fertilizer used as well. In calculating acres and amounts used, it was determined that approximately 40-60 lbs. of nitrogen is used per acre per year. This number will be a starting point to refer to for managed lawns of the city, school districts, cemeteries and golf courses.

The group discussed residential uses of nitrogen and it was speculated that approximately 1 in 10 residents apply nitrogen to their lawns. Some factors that deter usage are the cost, the use

of water and the upkeep of the green lawn. From this information it was estimated that residential fertilizer application is 10% of institutional nitrogen application rate or roughly 5 lbs. of nitrogen per acre per year.

The group was asked if they were willing to use the 5 pounds per acre as a starting point for calculating residential application; the group agreed. There was a discussion about what percentage of nitrogen used is organic such as manure, verses non-organic such as bags purchased at the store. It was estimated that it is roughly 50/50.

Commercial nitrogen application, such as through a lawn service, was discussed and it was determined that John Wingerden would be a good source of information for those numbers. Bob indicated he would ask John to contact commercial services to ask how much nitrogen they typically apply for customers.

Hobby farms and the nitrogen use at these farms was discussed. It was presumed that hobby farms are 5 acres or less and can be either animal or crop based. The management of these farms is varied due to what the hobby farm is used for. The working group adopted what it believed to be a reasonable hypothesis of hobby farm nitrogen contribution, and worthy of review and comment by the Data Collection Working Group. It is presumed that the acreage of hobby farms is 10% of Irrigated/Ag and that is a small percentage. Jim Davenport felt it could be presumed that 5% of GWMA is hobby farms. Hobby farms were further presumed to use 50% organic fertilizers and 50% inorganic fertilizers. The amount of nitrogen added at hobby farms should be presumed to be 50% of that applied in commercial crop operations.

Bob Farrell volunteered to speak to a friend who owns a hobby farm, and inquire about the size of the operation, how much of it is farmed, if fertilizer is applied and if so, how much. The purpose is to establish components that can later be adjusted.

Bob then asked the group if they agreed that all nitrogen loading sources related to RCIM had been identified, and they replied "yes."

The group discussed Groundwater use and the future uses for drinking water, potable water and irrigation. It was not identified in the original goals but it is listed in the WAC and is something that the group can look at.

Jim Davenport reminded the group that the GWAC is not addressing the issue of water supply. The group's focus is water quality, and how the application of water on top of nitrogen drives nitrogen down into the groundwater. He added that water supply keeps resurfacing because it's mentioned in WAC 173-100; however, Ecology's interpretation is that the WAC presents a laundry list: the GWAC does not need to address everything in the laundry list. He concluded by recommending that the group not spend too much time addressing groundwater supply.

The discussion then focused on food processors—industrial sources—that have vegetative by-products and where the waste ends up. Is it returned to the water waste system or does it go elsewhere such as being ground up into feed, taken to the landfill or processed into fuel? Bob asked if the RCIM needs to address nitrogen loading from these industrial activities, and Jim replied yes, that information should be filled in.

To determine that information, it was decided to look at the food processor businesses (canneries, wineries, etc.) in the GWMA area, which employ 50 or more people, to determine how much of the processing waste may contribute to nitrogen loading. Kathleen Rogers will speak with Bud Rogers to compile the list of such businesses in the area between Toppenish and Grandview.

Action Item: Kathleen and Bud Rogers will compile a list of food processing businesses in GWMA area.

Action Item: Bob Farrell will investigate how much nitrogen a typical hobby farmer might apply to his operations. He will also ask John Van Wingerden to investigate the typical amount of fertilizer a commercial operation applies to residential properties.

Resources Requested

-

Recommendations for GWAC

-

Deliverables/Products Status

-

Proposed Next Steps

- Next RCIM Meeting scheduled for May 28, 2015 10:00 AM-noon, Radio KDNA.

Residential, Commercial, Industrial, Municipal (RCIM) Work Group

Charge from Groundwater Management Area Advisory Committee

Working Group Members

Robert Farrell, Chair (Port of Sunnyside), Elizabeth Sanchey (Yakama Nation), Ryan Ibach (Yakima Health District), Jan Whitefoot (Concerned Citizens of Yakama Reservation), John Van Wingerden (Port of Sunnyside), Stuart Turner (Turner & Co.), Tom Ring (Yakama Nation), Kathleen Rogers (Citizen Rep), Sanjay Barik (Ecology), Dan DeGroot (Yakima Dairy Federation)

Meetings/Calls Dates

Meeting: June 25, 2015 10:00 am – 12:00 pm
Radio KDNA, 121 Sunnyside Ave., Granger, WA 98932
Call in: 509-574-2353 (pin 2353#)

Participants

Present: Robert Farrell, Chair (Port of Sunnyside), Sanjay Barik (Ecology), Jim Davenport (Yakima County), Lee Murdock (Yakima County), Yakima County Support Staff – Greta Smith

Key Discussion Points

- **Discuss nitrogen loading to residential lawns**
- **Discuss nitrogen loading at hobby farms**
- **Discuss nitrogen loading resulting from vegetative by-products of food processing industries.**

Residential Lawns: Bob Farrell shared the information he received from a commercial applicator for residential lawns. That source stated that liquid nitrogen is used, 5 pounds per acre, 1.8 % nitrogen per gallon, 9 lbs. nitrogen per acre per year on residential lawns. Assuming that only 1 of 10 residential lawns employs a commercial applicator, the nitrogen load would be .9 lbs per acre per year.

Another source believes that homeowners who do not employ commercial application purchase (2) 25 pound bags, 16-16-16, and apply it all to their lawn regardless of lawn size. It was assumed that homeowners over fertilize or over irrigate. Based on these figures, it was determined that RCIM's previous estimate of 5 pounds per acre per year for residential lawns (based on 1/10 of alfalfa fertilization (50 pounds per acre per year)) is probably high, and that a better estimate may be 2-3 pounds per acre per year for residential lawns

Jim will put these figures in a matrix that can be used when applying the Kimsey formula that has been used for septic system nitrate loading calculations. These figures are an estimate and can be adjusted.

Hobby Farms: Bob Farrell shared his findings on nitrogen loading on hobby farms. He spoke with a hobby farmer who stated that he has about 40 chickens and 30 turkeys. He cleans their coop every 5 – 6 months and uses the waste in his garden. He also has 15 acres with 40 head of cattle. He does not add additional fertilizer to the field where they are kept. It is naturally fertilized from the cattle. He has no other crops. He is probably a more serious hobby farmer than others. A second hobby farmer has 5 acres from which he takes 3 cuttings of grass hay a year. He fertilizes 1 time every 3 years, but does not notice a significant net profit gain from doing so due to consideration of additional fuel and labor costs.

It was also pointed out that most hobby farmers eschew commercial fertilizer preferring to be more organic in nature. It was determined that the RCIM's previous estimate of hobby farmers' use of 50% of the amount of fertilizer used by professional alfalfa farmers be reduced to a range of 20%-50%, as a function of hobby farm acreage. E.g., 0-2.5 acres = 20%; 2.5 -5 acres = 30%; 5 -10 acres = 40%

The working group reviewed the GWMA area map and the information it provides based on the work Mike Martian has done with GIS. All data gets put into GIS format with layers from USGS, water data, EPA, etc. and are plotted on the map. When all the layers of the GIS map are complete, it will be possible to estimate the total of the nitrogen loading assumptions. There was discussion regarding where Hobby farms should be included – would the acreage be included in the layer regarding residential lawns or in the layer with USDA information describing nitrogen loading by specific irrigated crops?

Food Processing: Kathleen and Bud Rogers provided a list of food processors in the GWMA area. Most of them are wineries and are permitted by the Department of Ecology.

Resources Requested

-

Recommendations for GWAC

-

Deliverables/Products Status

-

Proposed Next Steps

Data Collections, Characterization, Monitoring Work Group

Charge from Groundwater Management Area Advisory Committee

A discussion of timelines and details regarding the Nitrate Loading Assessment

Working Group Members

Kirk Cook (Chair); Andres Cervantes; Jan Whitefoot; Jim Trull; Kevin Lindsey; Laurie Crowe; Steve Swope; Stuart Turner; Thomas Tebb; Melanie Redding

Meetings/Calls Dates

Meeting: Thursday, April 9, 2015 10:00 a.m. to 12:00 p.m.

Call Number: 509-574-2353 pin: 2353#

Participants

Present: Kirk Cook (Chair), Jean Mendoza, Jim Trull, Charlie McKinney, Vern Redifer, Jim Davenport, Mike Martian, Cindy Kozma, Lee Murdock, Andy Cervantes*, Jaclyn Hancock*, Greta Smith (Yakima County Support Staff), Erica Naasz (Yakima County Support Staff)

*via phone

Key Discussion Points

- Nitrogen Loading Assessment Status
- Data on UIC Wells, NPDES Permits, Nitrogen Compound Spills, and Septic Systems
- USGS
- GWAC Timeline

Nitrogen Loading Assessment Status: Jim Davenport welcomed the working group. Kirk began discussion regarding the CAFO group expecting field data from EPA and Dairies. He noted that site-specific data on lagoon location size and capacity is being gathered, as well as collection of area data on livestock holding area(s) and composting areas. This will be combined with site-specific soil properties and nitrogen loading parameters to estimate nitrogen loading from livestock operations within the GWMA.

This analysis will be available on a GIS platform and accompanying database, and made available to Yakima County. WSDA will confer with the Livestock/CAFO work group regarding input parameters to estimate leeching rates and below root zone nitrogen loading.

He added that he needs studies related to loss of ammonia leaching from lagoons and how they deal with them. The group discussed the value of the GID System Layers, which is that all modules can be updated as new data becomes available. The group determined that the best course of action would be to use realistic values based on agreed-upon characteristics for now. Local data can be added at a later date.

ACTION: Kirk hopes to have the first segment of the Nitrogen Loading Assessment completed with recommendations to the CAFO/Livestock group by April 20, 2015.

Data on UIC Wells, NPDES Permits, Nitrogen Compound Spills, and Septic Systems: Mike Martian and Cindy Kozma, from Yakima County GIS, presented a geomap developed for the RCIM committee which shows parcels with septic systems in the GWMA area. One of the features of the map is the ability to put a point on these parcels using the building footprint layer. They added a ten foot buffer area from the foot print of the home to make a realistic assumption of where the septic system would sit as opposed to simply adding the point to the center of the parcel. Additional data GIS has available includes soil type, rooms, baths, owner occupied, and renter occupied residences from the 2010 Census. Mike also informed the group that the GIS layers could include State Waste Discharge Permits, large onsite septic systems, and potentially capturing lawn existence for fertilizer estimates.

The group also discussed leaching from these septic systems and was informed that Melanie Redding has put together a peer review analogy to figure out leaching data from septic systems. The group decided to invite Melanie to present this data at the May 14, 2015 Data meeting. Kirk will also be researching the numbers on leakage rates from lagoons and the nitrate contributions. He needs input on parameters for what to measure for each operation given the equation will remain the same. A peer review would be necessary to determine what diet the livestock is fed in determining nitrates in manure. The group discussed hobby farms and impact of fertilizer spills, concluding that the result may be an understanding that these issues have a small impact. If that turns out to be the case, they will still address all concerns brought to the table by other members and include them with the final data.

Mike also presented a map of Underground Injection Control wells within the GWMA area. In response to Jan Whitefoot's concern that individuals were placing waste directly into UIC/Dry Wells, Kirk stated that the risk of this is minimal due to the free disposal of waste in the state of Washington. It was pointed out that the Yakima County Transfer Station also takes in household hazardous waste for free. The group discussed that with these resources in place, it is unlikely that individuals would be putting waste into a UIC/Dry well. Unless there are specific examples or occurrences which can be investigated, no further movement will be made on this issue.

USGS: At last month's meeting Jean asked if she could contact USGS to identify where they currently are in their process and to maintain the conversation. A draft of her letter was sent out to some workgroup members. Information about an ongoing project between USGS and Tung Nuyen, a student at WSU, was discussed. He is working on development of a nitrate transfer model for the Lower Yakima Valley area. He intends to model the movement of nitrates through the groundwater to the Yakima River. He hopes to use the Lower Yakima Valley cells and related data from USGS model for the transmission algorithms. Jim announced that he had invited him to attend the April 16, 2015 GWAC Meeting.

Regarding Jean's letter to USGS, a final draft will be presented at the next meeting for the group to review.

ACTION: A draft letter response to USGS is to be approved by the Data group at the May 14, 2015 meeting.

GWAC Timeline: The Nitrogen Loading Assessment to be moved to July 2016. The Data Working Group is to present improvement on the completion assumption of 2017.

ACTION: Kirk was asked to go through the timeline and make relevant changes to the dates and return them to Vern no later than the April 16, 2015 GWAC Meeting.

The discussion ended with Vern asking the group what other tasks the Data Collection Group is working on other than Nitrogen Loading Assessment. The group noted they are reviewing documents from PPG, conducting cost benefit analysis for alternative advantage costs, how to access the money, and random monitoring of shallow wells.

Resources Requested

-

Recommendations for GWAC

-

Deliverables/Products Status

-

Proposed Next Steps

-

Data Collection, Characterization, Monitoring

Charge from Groundwater Management Area Advisory Committee

A discussion of timelines and details regarding the Nitrate Loading Assessment

Working Group Members

Kirk Cook (Chair); Andres Cervantes; Bill Dunbar; Bob Stevens; Charles Ellingson; Charlie McKinney; Chelsea Durfey; Dave Cowan; Donald Brown; Doug Simpson; Elizabeth Sanchey; Eric Winiecki; Frank Lyall; Ginny Stern; Jaclyn Hancock; Jan Whitefoot; Jean Mendoza, Jennifer MacDonald; Jim Trull; John Van Wingerden, Kevin Lindsey; Laurie Crowe; Lino Guerra; Melanie Redding; Mike Shuttleworth; Ralph Fisher; René Fuentes; Robert Farrell; Ron Cowin, Scott Stephen; Sheila Fleming; Steve Swope; Stuart Turner; Thomas Tebb; Dr. Troy Peters

Meetings/Calls Dates

Meeting: Tuesday, May 19, 2015 3:00 p.m. to 5:00 p.m.

Call Number: 509-574-2353 pin: 2353#

Participants

Present: Kirk Cook (Chair), Jean Mendoza, Charlie McKinney, Vern Redifer, Mike Martian, Lee Murdock, Andy Cervantes, Jaclyn Hancock, Laurie Crowe*, Ginny Stern*, and Erica Naasz (Yakima County Support Staff)

*via phone

Key Discussion Points

- USGS Letter
- Nitrogen Loading Assessment
- Septic System leachate methodology
- GWAC Timeline
- Ambient Groundwater Monitoring System

Welcome and Overview

Lee welcomed the group, no additions to the agenda were requested.

USGS Letter

The letter addressed to U.S. Geological Survey (USGS), was emailed to the group prior to the meeting. The USGS letter is an informational request to the USGS for future opportunities for collaboration between the GWAC and the USGS regarding the analysis of Nitrate Tracking. The group approved that it be sent out as it was merely a request for information and did not commit the GWAC in any way.

Nitrogen Loading Assessment

Kirk has presented the initial results of the Livestock Loading Assessment which identified the acreage for Corral/Pens (1,841 acres), compost (346 acres) and Lagoons and Storage Ponds (155 acres). The acreage was determined by using aerial photography which had been digitized to identify these components in the Groundwater Management Area. The next step in the process is to look at a variety of methodologies to determine nitrogen loading for each of these components.

These methodologies will be presented to the GWAC on June 18. A few of these include the USGS, Department of Ecology, Darcie's Law, and Herd and Herd density methodologies. The data group will review these at the next meeting and form a recommendation to the GWAC.

Kirk also presented this information to the CAFO/Livestock group which expressed an interest in hiring a consultant to determine the best methodology to use. Kirk expressed a concern that a consultant would review the same materials that his staff was using and could potentially slow down the project and be a waste of funds. It was recommended that the next Data Work Group meeting be combined with Livestock/CAFO so all parties could share in the discussion prior to the next GWAC meeting.

Septic system leachate methodology

Unfortunately Melanie Redding was not available to attend the meeting to present on the septic system leachate methodology. Kirk announced that he had a conversation with Melanie Redding, who provided the results of her extensive literature search. This methodology would be used in conjunction with the septic system maps produced by Yakima County GIS. Yakima County will need to review and agree with the equation before they use it to estimate nitrogen loading from septic systems. The copy of the GIS layer showing the septic systems in Yakima County will be emailed out to the group.

GWAC Timeline

The Nitrogen Assessment has been extended in relation to the second round of deep soil sampling. The new date is April 2016.

Ambient Groundwater Monitoring System

Vern announced that more work was needed to clarify the exact product the group needs from PGG to develop the ambient groundwater monitoring system that the group agreed upon earlier in the year. Next steps include having a discussion with Melanie and Tom with the Department of Ecology.

Resources Requested

-

Recommendations for GWAC

-

Deliverables/Products Status

-

Proposed Next Steps

-

Joint Data Collection and Livestock/CAFO Meeting

Charge from Groundwater Management Area Advisory Committee

Working Group Members

See working group memberships for Data Collection and Livestock/CAFO

Meetings/Calls Dates

Meeting: Department of Ecology, Seafoam Conference Room, 15 West Yakima Ave., Yakima

When: *June 11, 2015 from 1:00 pm to 3:00 pm.*

Call: (360) 407-3780 Pin #147221

Participants

Kirk Cook (Chair, Data Collection), Charlie McKinney (Chair, Livestock/CAFO), Jason Sheehan (GWAC), Jim Dyjak (GWAC), Jim Trull (GWAC), Ginny Stern (GWAC)*, Jaclyn Hancock (AGR), Jean Mendoza (GWAC), Kevin Lindsey (interested party), Larry Fendell (interested party), Laurie Crowe (GWAC)*, Melanie Redding (Ecology), Patricia Newhouse (GWAC), Steve George (GWAC), Stuart Turner (GWAC); Vern Redifer, Jim Davenport, Lee Murdock, Mike Martian (GIS), and Lisa Freund (Yakima County)

*via telephone

Key Discussion Points

Preliminary Evaluation of Livestock Facility Contribution to Nitrate Levels in Groundwater-Lower Yakima Valley GWMA -Kirk Cook, Washington State Department of Agriculture

Kirk Cook stated that the purpose of today's presentation– *Preliminary Evaluation of Livestock Facility Contribution to Nitrate Levels* – was to provide the group with three methodologies he and Jaclyn Hancock are proposing to evaluate Livestock Facility contribution to nitrate levels in groundwater. The three methodologies are the UC Davis Study; USGS/Ecology Study, and Darcy's Analysis. The group was asked to provide input and come to agreement on 1-2 methodologies best suited to conditions in Yakima County.

Kirk noted that the presentation and discussion will focus on concept and methodology, not on the specifics. The methodologies focus on estimating nitrogen loading from lagoons/ponds and nitrogen contributions from livestock corrals/pens.

Kirk explained each methodology in broad terms:

UC Davis. Generally the most rudimentary approach of the three methodologies. Aside from surface area, all other data is derived from other sources.

USGS/Ecology. Has more input parameters than the UC Davis approach, but still relies on assumptions and other publications.

Darcy's Equation. Relies on much more local data to derive loading estimates than the other two options.

Estimating Nitrogen Loading from Lagoons/Ponds (Discussion)
Based on 2014 aerial photography, it is estimated that there are approximately 200 active lagoons/ponds in the GWMA. A member observed that due to rapid technology advances, the number of active lagoons may be considerably less. The number may continue to drop, in part due to changes in practices coming out of the Dairy Consent Order. Kirk clarified that the estimate was a static snapshot from 2013-2014.

General discussion ensued regarding conditions in California's Central Valley (UC Davis study) versus Yakima County and lagoon conditions today versus five years ago. It was observed that permeability estimates used for the formulas may need to be modified and that there are likely fewer lagoons in use than the source data indicate.

Estimating Lagoon Leakage Using Darcy's Equation (Slide #12)
EPA Range for N concentration of the lagoon contents (Calculated total N) 290-1800 mg/L Avg: 1211.8 Median: 1210.4 mg/L
Kirk noted that the estimated nitrogen loading numbers from lagoon leakage rely on EPA's 2010 Final Report data. This data may be higher than actual conditions; however, it is currently the most defensible data available. He stated that the numbers used should reflect local conditions. Accordingly, he queried the group if they had more current data. Two members noted they might have access to data samples from lagoons. Kirk asked that if they had local data to please provide it to him.

Jim Davenport noted that any change to the range (i.e., median 1210.4 mg/L) will equate to an equal change to the loading rate percentage. Accordingly, the number is very important in calculating lagoon leakage.

Vern explained the mapping overlay being used to estimate septic system N loading to groundwater in the GWMA. He observed that the same type of calculations could be used for mapping the lagoons.

A member asked if various sources could be overlaid (lagoons, septic systems, fertilizer application). Vern responded, "Yes."

Jim Davenport asked if we have the ability to change the numbers later (response – yes). Any methodology can be rejected or accepted.

A member asked if additional methodologies (e.g., David Erickson) could be considered. (Response – yes). Today's presentation does not preclude Livestock/CAFO from stating it wants a different methodology.

Another member stated he is not ready to make a decision today. The group needs time to review the information; if another methodology is presented, it will require additional time to absorb the information and to reach a decision.

Jim Davenport asked Laurie Crowe if the South Yakima Conservation District (SYCD) has a source of local information (pond samples) that could be used in the formulas. Laurie responded yes, but sampling only occurs once annually. When asked if she had access to previous years' records, she said yes. Stu Turner stated he also has access to data records. Steve George agreed to work on obtaining data (yearly average).

DECISION: The group agreed that David Erickson's methodology will be reviewed at the next meeting.

Action: Laurie Crowe, Stuart Turner and Steve George will investigate obtaining and providing lagoon and pond data.

A member asked where manure composting is addressed. (Response-under corrals/pens).

Estimating N Contribution from Livestock Corrals/Pens

There was broad discussion around impacts of animal density, moisture and design differences. Members clarified that under "Items to Consider," pens are harrowed, not scraped. This clarification of a practice could result in a variable. For purposes of analysis, Kirk observed that the point is to arrive at a general happy medium people can live with. Charlie offered to develop a list of variables.

ACTION: Charlie McKinney will develop a list of variabilities for the next discussion.

The participants agreed to convene this joint working group in two weeks to continue the methodology discussion.

Mike Martian, Yakima County Geographic Information Systems (GIS), presented maps with overlays his department has created to identify septic systems in the lower Yakima Valley, with the ultimate goal of identifying nitrogen loading from that source. He noted GIS is using local census data for household numbers (3.8 persons per household). GIS is also assisting the RCIM identify lawn fertilization rates. He concluded that GIS uses models, which offers flexibility: numbers can be changed.

Meeting was adjourned at 3:15 pm.

Resources Requested

- N/A

Recommendations for GWAC

- N/A

Deliverables/Products Status

Proposed Next Steps

David Erickson's methodology will be forwarded to the working group for its review.

Charlie McKinney will develop a list of variabilities for the joint meeting on June 25.

Members with access to local lagoon and pond data will provide it to Kirk Cook.

Next Meeting: Thursday, June 25, 2015 from 1:00 PM-3:00 PM Location: Yakima County's First Street Conference Center (old Pizza Hut), 223 N. 1st St., Yakima

Proposed agenda:

Issues and Variables

Present other methodologies

Joint Data Collection and Livestock/CAFO Meeting

Charge from Groundwater Management Area Advisory Committee

Working Group Members

See working group memberships for Data Collection and Livestock/CAFO

Meetings/Calls Dates

Meeting: Yakima County Facilities First Street Conference Center, 223 N. 1st St., Yakima

When: June 25, 2015 from 1:00 pm to 3:00 pm.

Call: (509) 574-2353 Pin 2353#

Participants

Kirk Cook* (Chair, Data Collection), Charlie McKinney (Chair, Livestock/CAFO), Andy Cervantes* (GWAC), Dan McCarty (AGR), Jason Sheehan (GWAC), Ginny Stern* (GWAC), Jean Mendoza (GWAC), Kevin Lindsey* (interested party), Larry Fendell (interested party), Laurie Crowe* (GWAC), Melanie Redding (Ecology), Patricia Newhouse (GWAC), Steve George (GWAC), Sue Wedam (GWAC), Vern Redifer, Jim Davenport, Lee Murdock, and Lisa Freund (Yakima County)

*via telephone

Key Discussion Points

Nitrogen Loading Assessment – Evaluation of Proposals and Recommendations – Presentation by Melanie Redding, Washington State Department of Ecology

Lagoon Leakage Equations for the Nitrogen Loading Assessment. Melanie stated that her presentation was a follow-up to Kirk Cook's and Jaclyn Hancock's introduction of three methodologies at the June 11 meeting. Kirk and Jaclyn had broadly described the methodologies under consideration: UC Davis Study, USGS/Ecology Study and Darcy's Law. Today Melanie will review the equation used by all three methodologies –with the values and variables removed—so the group can become comfortable with the equation. This will provide the group with an "apples to apples" comparison of the various methodologies so they can come to a decision on which one they want to use. Following that decision, they can then determine the appropriate input values followed by a sensitivity analysis.

Melanie explained Darcy's Law, which describes fluid movement through porous media, and how it can be used to calculate the leakage (discharge) from a lagoon (see presentation). A broad discussion ensued.

UC Davis

A member asked if the UC Davis study measured permeability below the lagoon. Melanie responded no, it relied on assumptions, not actual data. She explained that only a handful of studies (e.g., Dennis Erickson, Ecology) had measured it through well monitoring. She noted that based on information at the last meeting – that lagoon practices have dramatically changed since Erickson's 1990's work – the group will need to identify which method would give them the best assumptions.

She observed that Kirk and Jaclyn's presentation was also based on Darcy's Law. It provides the most complete picture. Kirk had included denitrification and mineralization below the liner. When asked if "Area" includes lateral (sides) as well as the bottom of the lagoon, Melanie responded that again, this is another variable. The group needs to determine how detailed they want to be. The most precise measurements will also require the largest investment of time and money.

Jim Davenport asked what the most convenient "unit" scientists use for the area cross-section. Charlie responded that the unit should probably be in acres.

Melanie stated that deciding the variables is another process. She added that David Erickson's testimony (Cow Palace litigation) was also based on Darcy's Law – all methodologies under consideration are based on Darcy's Law.

A member asked how anyone knows if there is more leaching from the sides of the lagoon. Melanie responded nothing has been found yet – it needs more research.

A variables discussion ensued. A lagoon liner's intake, the slope of the lagoon, etc. are all variables.

Melanie recommended that the group start with Darcy's Law. Then identify the input values (how much do you want to drill down? How much do you want to spend?) Then identify sensitivity of input parameters: look at minimum, maximum and median values, then determine how much detail you want to pursue.

She reminded the group that they will have to reach a decision on what is good enough: for example, detailed measurements will require more resources, time and money than a less detailed approach.

A member asked if the premise is that all lagoons leak based on head, shouldn't they go directly to fixing the problem?

Charlie responded that the WAC requires the group to characterize the problem – in order to do that, we need to identify how much is leaking [from the lagoons].

Evaluation of Leakage from Lagoons & Ponds in Yakima County- Presentation by Jean Mendoza, Friends of Toppenish Creek

Jean provided a broad critique of the three methodologies, pointed out errors in each, and compared the values of the three studies against Dennis Erickson's methodology and values from the recent Cow Palace Dairy litigation. She described Friends of Toppenish Creek's proposal: to use the three different methodologies described by WSDA and four different concentrations of nitrogen in the liquid (see presentation).

Jim Davenport observed that he thought the objective of the exercise is to determine how much nitrogen makes it to groundwater: we need to be specific about our objective. He asked if Ecology would be comfortable if the group doesn't come back with an estimate of how much Nitrogen is making it to groundwater.

Charlie replied that how and when the nitrate makes it to groundwater will be considered, but that is a long process. The group will have to add the dimensions of time and depth to groundwater.

In response to a statement that Darcy's Law as applied does not account for denitrification below the [lagoon] liner, Kirk observed that he will account for this [in his approach]. Kirk added that Jim Davenport raised a good point: what do we want calculations based on—nitrogen loading to groundwater, or an estimate. Kirk concluded that he was comfortable with either approach, provided it is consistently applied and a consistent measure point is used for lagoons, Irrigated AG, RCIM, etc.

Charlie suggested that denitrification [below the liner] be added to the list of variables.

A lengthy discussion ensued regarding the dairy lawsuit data, with a member recommending that we use good science rather than biased court case data. [Note: at the end of the meeting, Jim Davenport explained that litigation data is not any more or less reliable than any other data. "*Don't throw it out, but don't over-rely on it.*" He further explained that "facts" as the judge considers them in litigation (elements in his application of the law) is different than the general public's definition of facts.]

The group agreed that Darcy's Law can result in a large range of numbers depending upon the variables.

Melanie reminded the group that unrealistic input values can give unrealistic numbers. It's not the methodology itself, it's the variables (input).

Charlie concluded that the group had talked a lot about equations and methodologies. He asked if the group was generally comfortable with the method as presented by Melanie. The group agreed they were.

It was a further agreed to add denitrification. Still on the table: do we want to talk about depth to groundwater. Again, it was stated that today's purpose was to agree on the methodology.

Charlie asked if the group agrees to use Darcy's Law. Most of the group agreed.

Meeting was adjourned at 3:15 pm.

Resources Requested

- N/A

Recommendations for GWAC

- N/A

Deliverables/Products Status

Proposed Next Steps

Next Joint Data/Livestock Meeting: Thursday, July 9, 2015 from 5:00 PM-7:00 PM Location: Department of Ecology Main Conference Room, 1250 West Alder St., Union Gap 98903

Proposed agenda:

Variables

Sources of Data

Regulatory Framework Working Group

Charge from Groundwater Management Area Advisory Committee

Define Existing Regulatory Framework Within the GWMA Boundary - Identify existing laws, policies, goals, and responsibilities of state, local, tribal, and federal governments for each source or activity that may affect the area's groundwater

Working Group Members

Andres Cervantes (DOH), Laurie Crowe (SCCD), Dan DeGroot (YDF), Chelsea Durfey (Turner and Co.), Jim Dyjak (CCYR), Larry Fendell (citizen), Steve George (YCFB), Charlie McKinney (DoE), Jean Mendoza (FTC), Nick Peak (EPA), Ginny Prest (WSDA), Vern Redifer (YCPS), Jason Sheehan (YDF), Jan Whitefoot (CCYR)

Meetings/Calls Dates

Meeting: April 2, 2015 1:00PM – 3:00 PM

Call Number: 866-299-3188 CODE #3607539437

Participants

Present: Andy Cervantes*, Jim Davenport, Dan DeGroot, Jim Dyjak, Larry Fendell, Charlie McKinney, Jean Mendoza, Lee Murdock, Ginny Prest, Vern Redifer, Jan Whitefoot, Erica Naasz (Yakima County Support Staff)

Key Discussion Points

- **How the Regulatory Framework Group should proceed to select a new Work Group Chairman**
- **Franchises for pipes**
- **Identify additional work elements for inclusion in the overall project timeline**
- **Discuss how to proceed with the study session approached previously envisioned**
- **Timeline for the Work Group**

Welcome and Meeting Overview: Jim Davenport welcomed the group and facilitated the meeting as chair due to the retirement of past chair Tom Eaton. Jim asked for additions to the agenda – Jan Whitefoot requested the addition of Franchises for Pipes be added.

Work Group Chair: The work group discussed the process that was used to determine the original selection of chairs during the formation of the GWAC. There was agreement that the original process was informal and involved members either volunteering or being recommended followed by a general consensus. The work group agreed they would move forward using this process to fill Tom Eaton's position.

Jim announced that Jean Mendoza had submitted her interest in becoming the chair of the Work Group and that he had received no other notices from GWAC members. He asked if anyone present at the meeting had an interest in chairing the work group. No one else responded affirmatively. The members of the Work Group present concurred that Jean Mendoza would succeed Tom Eaton as the chair of the Work Group. Jim offered that Jean chair the remainder of the meeting. Jean deferred to Jim to finish facilitation of this meeting.

This topic was revisited when another work group member arrived and additional discussion regarding process for selecting chairs occurred. There was concern that should the process change from the one used in the formation of the GWMA, there would be a long-reaching impact on progress to the group's goal.

Franchises for pipes: Jan expressed concern about Yakima County granting "franchises" to private parties to permit pipelines to cross under county roads. Jan stated that these franchises facilitate distribute of liquid wastes into land application or disposal sites. Vern clarified that a franchise (permit) for pipes allows a private individual to utilize public right of way over roads. *The current process does not include where those pipes are being discharged and as a result, are a* potential gap in the regulations. The Work Group concurred that the issue of franchises should be included within the purview of the Work Group.

ACTION: Add Franchise for pipes to list for Regulatory Framework.

Study session next steps: The group discussed the feedback from the first Study Session held on February 19, 2015 and how to integrate that feedback into the next two planned study sessions. There was concern that there was not enough time to cover all the necessary information and a variety of options were discussed on how to proceed moving forward. It was decided that the best approach would be more of a round-table discussion where the presenters only provide a short presentation and the remainder of the time spent asking direct questions and having a group discussion. Jim stated that he had already scheduled Bonda Habets and Laurie Crowe for the original April 23rd session. Ginny concurred that she also had that date blocked out. The group decided to move forward with this roundtable method, but for a shorter list of topics.

After much discussion around which topics those should be, Jim asked the work to identify their top priorities for discussion which included a myriad of program areas, new and existing regulations, and more. This led to a discussion around conducting an analysis on current regulations in order to identify gaps and areas of overlap in order to move forward in a systematic manner. Some of this work had been done early on in the process and while there was interest in doing this moving forward – specific action steps were not identified.

Regarding the next study session, it will occur on the previously scheduled date at the First Street Conference room. Topics will include:

Dairy Nutrient Management Act, RCW 90.64, WAC 16-611, Ginny Prest, Washington State Department of Agriculture. Jean Mendoza later requested that subject of Dairy Nutrient Management Act, RCW 90.64, be delayed to a later study session.

Washington State Conservation Commission, South Yakima Conservation District, RCW 89.08, Laurie Crowe, South Yakima Conservation District

Nutrient Management (Code 590), Bonda Habets, State Resource Conservationist, USDA-Natural Resources Conservation District (NRCS), Washington State Office, Spokane.

ACTION: The group agreed to move forward with another study session on April 23rd, 2015.

Timeline: The group agreed that the timeline would require at least another year which will be added to the timeline. The ultimate goal of this group is to present a draft of recommendations to the GWAC.

Resources Requested

-

Recommendations for GWAC

-

Deliverables/Products Status

-

Proposed Next Steps

-

Regulatory Framework Working Group

Charge from Groundwater Management Area Advisory Committee

Study Session II

Working Group Members

Jean Mendoza – Chair (Friends of Toppenish Creek), Andres Cervantes (Department of Health), Charlie McKinney (Department of Ecology), Chelsea Durfey (Turner and Co.), Dan DeGroot (Yakima Dairy Federation), David Newhouse (interested party), Ginny Prest (AGR), Jason Sheehan (Yakima Dairy Federation), Jim Dyjak (Concerned Citizens of the Yakama Reservation), Larry Fendell (interested party), Laurie Crowe (South Yakima Conservation District) Nick Peak (Environmental Protection Agency), Pat Newhouse, (Community Rep Position #2), Steve George (Yakima County Farm Bureau), Sue Wedam (Community Rep Position #2), Stuart Crane (interested party), and Vern Redifer (Yakima County representative)

Meetings/Calls Dates

Meeting: District Court Probation Office, 104 N. First Street, Yakima WA

1:00 p.m. to 4:00 p.m. Thursday, April 23, 2015

Participants

Present: Bonda Habets, Tracy Hanger, Kevin Davis, Jean Mendoza, Jim Davenport, Jim Dyjak, Steve George, Charlie McKinney, Patricia Newhouse, Laurie Crowe, Vern Redifer, Ginny Prest, Larry Fendell, Lee Murdock, Dan DeGroot, Stuart Crane, Andres Cervantes, and Erica Naasz (Yakima County Support Staff)

Key Discussion Points

Welcome and Introductions – Jean Mendoza

The Regulatory Study Session began with Bonda Habets providing a broad overview of the USDA Natural Resources Conservation Service (NRCS). NRCS is an agency of the United States Department of Agriculture (USDA) that provides technical assistance to farmers and other private landowners and managers. NRCS has six mission goals: high quality, productive soils; clean and abundant water; healthy plant and animal communities; clean air; an adequate energy supply; and working farms and ranchlands. NRCS helps landowners develop conservation plans and provides advice on the design, layout, construction, management, operation, maintenance, and evaluation of the recommended, voluntary conservation practices. NRCS activities include farmland protection, upstream flood prevention, emergency watershed protection, urban conservation, and local community projects designed to improve social, economic, and environmental conditions. To aid in this they also conduct soil surveys, conservation needs assessments, and the National Resources Inventory to provide a basis for resource conservation planning activities.

The 2012 State Resource Assessment: Priority Resource Concerns for Washington State (SRA) was distributed. The SRA is based on parameters and guidance established by the NRCS National Office. Within these national parameters, NRCS Washington utilized the state resource inventory and assessment products that were developed through the Local Work Group (LWG) process in 2009, 2010 and 2011, and the 2012 Tribal Resource Assessment (TRA). It addresses locally identified resource concerns on five land uses: crop, forest, range, pasture and other associated agriculture lands. Once the LWGs and tribes identified their local priority resource concerns for each of these land uses, the assessment process is used to identify the targeted treatment areas and associated acreages.

NRCS offers voluntary programs to eligible landowners and agricultural producers to provide financial and technical assistance to help manage natural resources in a sustainable manner. Those who are under contract with NRCS must adhere to relevant standards for the projects that are being funded. Current Washington state Financial Assistance program include:

- The Agricultural Management Assistance (AMA) helps agricultural producers use conservation to manage risk and solve natural resource issues through natural resources conservation.
- The Conservation Stewardship Program (CSP) helps agricultural producers maintain and improve their existing conservation systems and adopt additional conservation activities to address priority resources concerns.
- The Environmental Quality Incentives Program (EQIP) provides financial and technical assistance to agricultural producers in order to address natural resource concerns and deliver environmental benefits such as improved water and air quality, conserved ground and surface water, reduced soil erosion and sedimentation or improved or created wildlife habitat.

The conservation practice standard contains information on why and where the practice is applied, and it sets forth the minimum quality criteria that must be met during the application of that practice in order for it to achieve its intended purpose(s). State conservation practice standards are available through the Field Office Technical Guide (FOTG).

Standards referenced in the Study session included:

- Standard 590 – Nutrient Management which focuses on managing the amount (rate), source, placement (method of application), and timing of plant nutrients and soil amendments. This practice applies to all lands where plant nutrients and soil amendments are applied. This standard does not apply to one-time nutrient applications to establish perennial crops. The purpose of this standard is:
    - To budget, supply, and conserve nutrients for plant production.
    - To minimize agricultural nonpoint source pollution of surface and groundwater resources.
    - To properly utilize manure or organic by-products as a plant nutrient source.
    - To protect air quality by reducing odors, nitrogen emissions (ammonia, oxides of nitrogen), and the formation of atmospheric particulates.

  - To maintain or improve the physical, chemical, and biological condition of soil.
- Standard 313 – Waste Storage Facility which is defined as a waste storage impoundment made by constructing an embankment and/or excavating a pit or dugout, or by fabricating a structure. The purpose of the practice is to temporarily store wastes such as manure, wastewater, and contaminated runoff as a storage function component of an agricultural waste management system. This practice applies:
  - Where the storage facility is a component of a planned agricultural waste management system;
  - Where temporary storage is needed for organic wastes generated by agricultural production or processing;
  - Where the storage facility can be constructed, operated and maintained without polluting air or water resources;
  - Where site conditions are suitable for construction of the facility; To facilities utilizing embankments with an effective height of 35 feet or less where damage resulting from failure would be limited to damage of farm buildings, agricultural land, or township and country roads;
  - To fabricated structures including tanks, stacking facilities, and pond appurtenances.

  There was additional discussion around Standard 313 with clarification that there was a distinction between manure and Agricultural waste; while waste denotes unwanted material, manure is a nutrient material.

- Standard 449 – Irrigation Water Management which outlines the process of determining and controlling the volume, frequency, and application rate of irrigation water. This practice is applicable to all irrigated lands and its purpose includes:
  - Improve irrigation water use efficiency
  - Minimize irrigation induced soil erosion
  - Decrease degradation of surface and groundwater resources
  - Manage salts in the crop root zone
  - Manage air, soil, or plant micro-climate
  - Reduce energy use

Throughout the presentation Bonda reiterated that the Standards were not designed to be regulatory; they were only required for producers who were under contract with NRCS.

The presentation also included information regarding the National Environmental Policy Act (NEPA). All recipients of NRCS funds must have their project undergo an Environmental Review (ER) as a recipient of Federal Funds.

The attendees asked a variety of questions related to how NRCS managed their contracts with producers; presenters clarified that all contracts are "reimbursement only" at a range from 25-75% of the cost of the improvement. They also clarified that all contracts contain an itemized budget to separate costs. There were additional questions regarding how producers implement the NRCS standards and how NRCS investigated the impact of funded activities – specifically, could a farmer

be contracted for one process that does not pollute the area, yet still pollute another area. The presenters clarified that they only investigated activities funded. There was additional clarification that the standards are voluntary; however, any nutrient management plans which are filed as a contractual requirement must adhere with the associated standards.

It was asked if the NRCS performed assessments – the presenter clarified that they perform assessments on all past practices and standards to determine their efficacy. They also stated that the voluntary method had worked well in the past and cited projects in Granger and Sulfur Creek as successes achieved through the voluntary standards method.

Additional questions related to the standards focused on how to apply them based on when the element was designed. Many standards provide an estimated lifespan for an element if it is built using NRCS standards. Presenters clarified that the purpose of this was to not make a determination of the definitive lifespan – only the expected lifespan as it relates to the implementation of the standards. Jean suggested that the NRCS State Engineer, Larry Johnson, could possibly speak to the Livestock/CAFO Group to answer more questions.

The presenters were asked if they knew how many producers voluntarily adhered to Standard 590 – Nutrient Management – NRCS stated that they did not have those numbers specifically. This led to a discussion regarding standards for fertilization application to which NRCS responded that fertilizer application would fall under Standard 590 but clarified again that this would only happen if the producer was receiving federal funds and under contract.

Jean questioned which regulatory and non-regulatory actions could be used to protect groundwater. She asked NRCS how they could promote groundwater protection. NRCS responded by stating creating policies is hard due to every farm being different, that Nutrient Management is also different on each farm. Jean then asked NRCS for their opinions for best management practices. NRCS stated to get anywhere you would need to start with Standard 449 – Irrigation Water Management and Standard 590 – Nutrient Management.

Jean asked what the estimated federal pool amount spent on Yakima County related to Nutrient Management. Answer: No cost share recorded for Yakima County although they recorded the following Nutrient Management acres: 500 acres in 2013, 65 acres in 2014, and 9 acres so far in 2015.

Resources Requested

-

Recommendations for GWAC

-

Deliverables/Products Status

-

Proposed Next Steps

- The Regulatory Framework Group is to discuss the Study Session II conversation and compile a list of questions for clarification for the NRCS at a later date.

Regulatory Framework Working Group

Charge from Groundwater Management Area Advisory Committee

[Insert Charge]

Working Group Members

Jean Mendoza, Chair (Friends of Toppenish Creek), Andres Cervantes (Department of Health), Bill Dunbar (Environmental Protection Agency), Charlie McKinney (Department of Ecology), Chelsea Durfey (Turner and Co.), Dan DeGroot (Yakima Dairy Federation), Ginny Prest (Department of Agriculture), Jason Sheehan (Yakima Dairy Federation), Jim Dyjak (Concerned Citizen of Yakama Reservation), Laurie Crowe (South Yakima Conservation District), Patricia Newhouse (Lower Valley Community Representative), Steve George (Yakima County Farm Bureau), Sue Wedam (Lower Valley Community Representative), Vern Redifer (Yakima County Public Services), Jim Davenport (Yakima County Public Services)

Meetings/Calls Dates

Meeting: May 13, 2015 1:00PM – 3:00 PM

Call Number: 509-574-2353 CODE #2353

Participants

Present: Jean Mendoza, Andy Cervantes*, Bill Dunbar*, Ginny Prest*, Charlie McKinney, Jason Sheehan, Jim Davenport, Larry Fendell, Lee Murdock, Laurie Crowe*, Patricia Newhouse, Dave Newhouse, Steve George, Vern Redifer, Jim Dyjak, Lee Murdock, Greta Smith (Yakima County Support Staff)

*via phone

Key Discussion Points

- **Ground Rules**
- **What does the Final Product for the Regulatory Working Group need to include?**
- **Who do we need to hear from in order to evaluate the regulatory and non-regulatory programs?**
- **Timeline for the Study Sessions**
- **What are the Goals & Objectives for the Regulatory Working Group?**

Ground Rules

Jean Mendoza started the discussion of Ground Rules by asking the Working Group what is a quorum? Who is able to vote? And how should multiple viewpoints be presented? There was a summary that at the last GWAC meeting there was clarification that work groups could have members who were not GWAC members as all decisions made by the work groups are presented to the GWAC. The decision was then between allowing all in attendance at a work group meeting to vote or only Formal work group Members. Jean stated that the past decision regarding this could not be located and that she wanted the group to discuss. Pros and Cons for each was discussed. Feedback themes included concern that members of the public would not maintain involvement without a voice in work group voting and that recommendations should come from meaningful conversation and not just a vote of individuals who show up. The decision moving forward was that the work group would maintain consensus for recommendations presented to GWAC. With no vote, the issue of quorum was not further discussed. Regarding circumstances where there are multiple viewpoints identified, it was determined both should be presented to the GWAC for final decision should no consensus be reached by the group.

Final Product of the Regulatory Working Group

Jean began this topic discussion by asking if any members had any preconceived ideas of what the final product of the work group should be or look like. There was discussion about the work group plans that were developed in the past and distributed to the GWAC members. There was a request that it be brought to the next meeting for reference. Jean distributed WAC 173.100.100 for additional review to assist the group in ensuring they are following the law. There was clarification that the work group plans came directly from the WAC with added roles. Jean reminded the group that a lot of time was spent developing a mission for the Regulatory group in the past, but as of yet have not developed goals and objectives for the final product. To accomplish this, Jean asked the group how much time they were willing to spend working online to develop the final product. It was recommended by the group that review of materials online was acceptable, but should there be a complex issue regarding decision making it would be best to meet face-to-face. There was also agreement that providing materials online to review prior to meetings was very helpful to set expectations and enables the group to arrive at the meeting prepared. Additional discussion regarding the shape of the final product of the work group continued into the following agenda items.

Timeline for the Study Sessions

At this time there are monthly study sessions set through September. Jean asked if it feasible to have a study session and work group debrief on the same day. There was agreement that the presentations are information heavy and difficult to process a week or two after the fact. There was a request that outlines be submitted beforehand to give participants an opportunity to ramp up prior to the presentation. There was a decision to schedule 1 hour post presentation to process the information. There was a suggestion that a quick summary after the meeting could be produced and sent out to the GWAC for educational purposes which lead to a discussion regarding the goals for the study sessions and the role of the work group. The group agreed that rather than educating the GWAC on all of the regulations, that the Regulatory group was the

main body that would become educated on the relevant regulations in order to make recommendations to the GWAC and ultimately to the final program.

Action: Jim and Jean will move forward with scheduling presenters

Jean led the discussion pointing out that it is challenging to identify the gaps between the current regulations and that more information is needed. She suggested that the group look the regulatory and non-regulatory programs that CAFO, Irr/Ag, and RCIM interact with and determined how they affect/contribute to the each of those sources. There was a question about the Gap Analysis that Lee had started to produce after the last work group meeting. There was also clarification regarding the definition of a Gap Analysis. Specifically, that it did not necessarily only look for gaps in regulations, but rather looks at the need (problem definition), current resources, and identifies that gap between those two things. Lee agreed to provide an outline of the process for the next work group meeting for the group to review. The issue of the final product of the work group was tabled until the next meeting.

Action: Lee will write up an outline for the proposed Gap Analysis and present it at the next meeting.

Goals & Objectives for the Regulatory Work Group

While there was initial discussion around goals & objectives, in the interest of time this topic was tabled until the next meeting.

Meeting Adjourned: 3:15 PM

Resources Requested

-

Recommendations for GWAC

-

Deliverables/Products Status

-

Proposed Next Steps

- Next meeting: Wednesday, June 10, 2015, 12:00 PM-3:00 PM at First Street Conference Center, 223 N. 1st Street

Regulatory Framework Working Group

Charge from Groundwater Management Area Advisory Committee

[Insert Charge]

Working Group Members

Jean Mendoza, Chair (Friends of Toppenish Creek), Andres Cervantes (Department of Health), Bill Dunbar (Environmental Protection Agency), Charlie McKinney (Department of Ecology), Chelsea Durfey (Turner and Co.), Dan DeGroot (Yakima Dairy Federation), David Newhouse (interested party), Ginny Prest (WSDA), Jason Sheehan (Yakima Dairy Federation), Jim Dyjak (Concerned Citizen of Yakama Reservation), Larry Fendell (interested party), Laurie Crowe (South Yakima Conservation District), Nick Peak (EPA), Patricia Newhouse (Lower Valley Community Representative), Steve George (Yakima County Farm Bureau), Stuart Crane (Yakama Nation), Sue Wedam (Lower Valley Community Representative), Vern Redifer (Yakima County Public Services), Jim Davenport (Yakima County Public Services)

Meetings/Calls Dates

Meeting: June 10, 2015 12:00 PM – 3:00 PM

Call Number: 509-574-2353 PIN #2353

Participants

Present: Jean Mendoza, Andy Cervantes*, Dan DeGroot, Ginny Prest, Charlie McKinney*, Jan Whitefoot, Jim Davenport, Jim Dyjak, Kathleen Rogers*, Larry Fendell, Laurie Crowe, Patricia Newhouse, Steve George, Stuart Crane, Tom Tebb, and Vern Redifer; Lee Murdock, Lisa Freund (Yakima County Support Staff)

*via phone

Key Discussion Points

- **Conservation District Overview - Laurie Crowe, South Yakima Conservation District**
- **Dairy Nutrient Management Program Overview-Ginny Prest, Department of Agriculture (WSDA)**

Conservation District Overview

Laurie Crowe provided an overview of conservation districts: the history, origins, governing board, duties, funding and responsibilities. (See PowerPoint presentation).

She explained that conservation districts are not regulatory agencies, nor are they a subset of the State or County—they are a stand-alone entity. The South Yakima Conservation District (SYCD) partners closely with Department of Agriculture (WSDA), WSU Extension, and the irrigation districts. The district is funded through grants and assessments. SYCD distributes funding (e.g., for irrigation conversions) primarily through a cost/share methodology.

Dairy Nutrient Management Plans (RCW 90.64.070)

Laurie reviewed the responsibilities of conservation districts relative to Dairy Nutrient Management Plans (DNMP). She clarified that only dairy operations are required to have a DNMP. The law, RCW 90.64, requires National Resources Conservation Service (NRCS) standards and specifications, and requires conservation districts to review and certify the DNMP. The SYCD has no enforcement authority.

The question was asked if there is a charge to the dairies, and Laurie replied that there is no charge.

The question was asked if dairies would be considered out of compliance if the SYCD had no funding for its review and certification process. Laurie responded that no, RCW 90.64 states that the dairy will not be out of compliance.

Jim Davenport asked if the GWAC recommended funding be available in this area, could this authority be utilized to obtain funds from the state conservation commission. Laurie replied that it could. (See slide #13)

Further questions: can we make a request for education and outreach? (Response – yes). Can we make a funding request for an irrigation management plan? (Response - possibly.) What is your typical annual budget? (Response – $200,000 +/-; however, much of that is pass-through funding).

Laurie noted that funding is typically obtained through grants. There might be the potential available for the mobile IAWG program through this source. Tom Tebb observed that Ecology offers grants that complement projects related to non-point source pollution.

Laurie explained that conservation districts benefit from an assessment, collected through property taxes, on irrigated agriculture properties. The assessment is $5.00 per parcel plus $.10 per acre. The SYCD collects approximately $68,000 annually from this source. In response to an observation that the district previously had projects on Mud Lake drain, Sulfur Creek and others, she responded yes, and that grants must be project specific: rarely can a district go back to a previous project [such as those named].

Laurie was asked if the SYCD provides an engineering component and she replied no. The NRCS no longer has an engineer, either. However, the district does have a cost/share to assist with engineering from a private firm. In response to a question regarding what triggers a DNMP update, she responded that an increase in herd size by greater than 10% or change in acreage. She added that it is written into the plan what the triggers are and what happens when the limit is exceeded.

Laurie was asked what role the conservation districts play in other areas that are looking at nitrates – for example, California. Ginny Prest clarified that there are different regulations in

different states: in San Joaquin California, for example, the DNMP is split into two components: the manure handling plan and a nutrient land application plan.

Further questions: who writes the DNMPs? (Response – The conservation district assists; experience has taught them that it is challenging for a consultant to write a plan). Jim Davenport asked if there is a template or boilerplate for a dairy nutrient management plan. (Response – no). Jim observed it would be helpful for this group to review the standard plan language, as it would inform this group on the subject matters and issues. In reviewing the checklist (page 2), the question was asked what is the trigger for soil/manure testing. (Response – the testing is required so there is no trigger. The checklist needs to be updated to reflect this). When asked if the conservation district believes that a DNMP is sufficient to protect groundwater, Laurie said yes, provided the recommendation/requirements in the DNMP are followed.

Further questions: has SYCD had recent cost/share projects? (Response – yes, three irrigation conversion projects totaling $26,000 in 2015). What percent of [Laurie's] time is spent on DNMP's? (Response – the majority of her time is spent on the plans. Remaining time (20-30 hours per month) is dedicated to district manager and bookkeeping duties. She also serves on the GWAC, Resource Conservation and Development (RC & D) and other boards.

In response to a question about the SYCD's former free tree-planting program, Laurie replied that SYCD's primary focus is agriculture, as the lower Yakima Valley is primarily agricultural. On the other hand, the North Yakima Conservation District has more streams and tributaries and hence has a tree program. Each district focuses on the specific characteristics and needs of its area.

Jean raised a question about muskrat habitat quality in the lower Yakima Valley, and offered her opinion that agencies are "pushing us in the direction of a dairy-centered economy." After lengthy discussion Laurie observed that vegetative buffers are the purview of the irrigation districts, not within the scope of the SYCD.

The question was asked if the individual plans identify where excess manure is shipped [off premises]. (Response – no. However, the plan will indicate who will receive excess manure and the volume). A lengthy discussion followed. Laurie explained that if the land base is not adequate for the amount of manure, the plan will indicate with whom the owner has signed agreements [to remove it] and how much manure is planned to be removed. The destination is specified if the dairy does not have enough owned/leased application land base. The group was reminded that neither WSDA nor SYCD has jurisdiction on the Reservation.

It was observed that the purpose of the questions was not finger-pointing, but to gain data. A discussion ensued regarding creating a formula based on the data to identify the amount of manure removed, how much remains, and how much adds to nitrogen loading. It was determined that this was a question for the Data Collection working group.

Action: Ginny will follow up with Kirk Cook regarding data and remand the question back to the Data group.

Further questions: what is the rate of compliance for DNMPs within the SYCD? (Response – high). What are the information sharing opportunities for the EPO? (Response – post information in the SYCD office, share with the NRCS and Board of Supervisors, ask the Farm Service Agency

(FSA) and the Dairy Federation post it in their newsletters.) If we had money to help with your work, what would you do with it? (Response – irrigation conversions and nutrient management.) Laurie added that moisture meters would be very helpful. When asked why, she observed that it is an instant clue to over-irrigating, high water table, etc. A discussion ensued regarding various moisture meter products, proprietary software, and dealers (GS Long, Simplot).

Moisture meter outreach ideas: invite Simplot/other purveyors to address the GWAC (talk to Dave Fraser, on the IAWG); identify who should be targeted, get the message out about the probes and the pros to them; talk to Troy Peters; host another growers' workshop; ask the *Daily Sun News* run a series on irrigation).

A selling point for a moisture probe program would be the current drought conditions: it's an opportunity to address a current condition [drought] and partner it with the GWAC's work. The question was asked if there might be drought money available that could be used for this purpose. The group concluded that ultimately this idea is the purview of the IAWG.

Dairy Nutrient Management Program Overview (RCW 90.64)-Ginny Prest, Department of Agriculture (WSDA)

Ginny Prest provided an overview of WSDA's Dairy Nutrient Management Program (see presentation).

She pointed out gaps in the current regulations. 1) WSDA cannot require dairies to follow their DNMPs. 2) While dairies cannot discharge to the waters of the state, that mandate is difficult to apply to groundwater because it is difficult to track the pollutant directly to the source of pollution. 3) Agronomic application records are a requirement but when nutrients are applied at rates above agronomic rates enforcement is limited. When asked to define an agronomic rate, Ginny explained that it is "meeting crop needs." Simply put, applying nutrients at the right time, at the right place, and in the right amount. The important point is, identifying how much nitrogen is left after nutrient uptake. Geographic adjustments (eastside and westside requirements may need to be different) may have to be made; it still under question at WSDA. She observed that big dairies are hiring consultants and trying to meet the DNMP requirements. She observed that tremendous progress has been made in the Dairy Nutrient Management Program in the last 10 years. She felt that education and comments made during inspections were key to this.

Ginny also stated that the Clean Water Act applies to surface water only, while the Safe Drinking Water Act applies to groundwater. Jean agreed to look this up.

She also noted a shortcoming in the current rule (WAC 16-611): the one-foot soil testing requirement is insufficient. It should go deeper (3 to 4 feet depending on crop rooting depth) in order to get at groundwater. The issue is moving to something that can be documented.

ACTION: The request was made to ask the Department of Ecology and WSDA Water Quality Committee to make a presentation to this group.

Ginny reviewed her 11 year history with WSDA, noting that record-keeping has improved over time. Ginny continued that the dairy industry is the only one required to keep records. They must document what/where they're moving the manure.

A question was raised whether a DNMP identifies the Yakama Reservation as a manure export destination. A lengthy discussion ensued, with Laurie reminding the group again that the DNMP does not identify where the manure may be taken. She explained again SYCD's responsibilities and the WSDA's authority relative to Dairy Nutrient Management Plans. Current regulations require dairies to keep record of nutrient analysis and, if they are exporting manure, to identify who is receiving the manure and how much. For questions about the Reservation, members were advised to contact the EPA.

A concern was also expressed about how thoroughly WSDA investigates complaints of manure spills.

Ginny stated that some of the questions raised reflect gaps in regulations. WSDA only has authority over surface water discharges (dairies cannot discharge to waters of the State), reporting and ensuring that the dairies have a DNMP. She added that WSDA is issuing compliance notices and penalties. Statewide, 45 penalties representing 25 dairies have been issued. Most are in Whatcom County. She agreed to report back on enforcement statistics for Yakima County for the last five years.

Action: Ginny Prest will come back to this group in August to take additional questions and report back on enforcement statistics for Yakima County for the last five years. She will address compliance rates (85% compliance versus 15% noncompliance) in Yakima County, in response to the question, *approximately many animals are represented in the noncompliant dairies?*

Parking lot questions: Ginny will follow up with Kirk Cook regarding manure separation statistics and the amount of nitrogen loading from that source. The information will be reported back to the Data group.

Future Sessions

Due to lack of time, the draft timeline and goals and objectives were not discussed. Jean reminded the group that the goals and objectives need further discussion.

The group agreed to skip the July meeting and hold its next meeting on August 12 at Radio KDNA. The meeting will begin at 5:30 PM to allow more participants to attend.

Action: Participants were asked to write down the highlights of today's presentations and leave them with Jean before departing. Alternately, participants may email their highlights to Jean.

Action: Jean will ask the Department of Ecology and WSDA's Water Quality Committee to make a presentation to this group.

Action: Ask Simplot/other purveyors of irrigation equipment to address the GWAC.

Meeting Adjourned: 3:15 PM

Resources Requested

-

Recommendations for GWAC

-

Deliverables/Products Status

-

Proposed Next Steps

- Next meeting: Wednesday, August 12, 2015, 5:30 PM - 8:00 PM at Radio KDNA in Granger

  Proposed agenda:
  Review Workgroup Goals and Objectives
  Review Future Agenda List: What's missing?
  Continue Dairy Nutrient Management Program discussion (Q&A) Ginny Prest

Attachment B

- Deep Soil Sampling Report- Spring 2015
- Lower Yakima Valley Groundwater Management Area Plan - Table of Contents
- Sample Letter (English & Spanish) to Phase I High Risk Well Assessment Survey Participants with N results ≥ 10 mg/L

Letter Enclosures

- Updated Certified Laboratory List
- DOH Private Wells 333-171 (English and Spanish)
- DOH Nitrate in Drinking Water 331-214 (English and Spanish)
- DOH Coliform 331-179 (English and Spanish)

LOWER YAKIMA VALLEY GROUNDWATER ADVISORY COMMITTEE

Groundwater Management Area (GWMA)

Deep Soil Sampling - Spring 2015

2035

Acres 40
Soil Testing? YES
Test Frequency Annually in Fall
Irrigation Type Pivot
Irrigation Schedule Observe Crop
Hour Sets
Irrigation years 10

NO3 (#N/ACRE)	
4/28/2015	
1 ft	55
2 ft	56
3 ft	56
4 ft	103
5 ft	110
6 ft	93
TOTAL	473
NH4-N	108
ORGANIC	3.04

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	434	0	0	0	434
2014	50	0	391	0	0	0	441
2013	50	0	317	0	0	0	367
2012	50	0	430	0	0	0	480

Comments

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition
Triticale	6 Tons			Good Actual
Triticale	6 Tons	Corn Silage	28 Tons	
Triticale	6 Tons	Corn Silage	28 Tons	
Triticale	6 Tons	Corn Silage	28 Tons	

Soil 18 - Cleman Very Fine Sandy Loam 0-2% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	M	4.2	
B	S	M	5.2	
C	S	M	4.5	
D	S	M	4.5	
E				

2036

Acres 33
Soil Testing? YES
Test Frequency Annually
Irrigation Type Linear Move
Irrigation Schedule Observe Crop
Hour Sets
Irrigation years 6

NO3 (#N/ACRE)	
4/28/2015	
1 ft	90
2 ft	47
3 ft	31
4 ft	23
5 ft	12
6 ft	6
TOTAL	209
NH4-N	65
ORGANIC	2.37

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	50	0	434	0	0	0	484
2014	0	0	166	0	0	0	166
2013	0	0	434	0	0	0	434
2012	0	0	435	0	0	0	435

Comments

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition
				Good Actual
Triticale	6 Tons	Corn Silage	28 Tons	
Triticale	6 Tons	Corn Silage	28 Tons	
Triticale	6 Tons	Corn Silage	28 Tons	

Soil 18 - Cleman Very Fine Sandy Loam 0-2% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	M	5.5	
B	S	M	5.2	
C	S	M	4.8	
D	S	M	5.6	
E				

2037

Acres 38
Soil Testing? YES
Test Frequency Annually
Irrigation Type Pivot
Irrigation Schedule Observe Crop
Hour Sets
Irrigation years 10

NO3 (#N/ACRE)	
4/28/2015	
1 ft	50
2 ft	106
3 ft	226
4 ft	183
5 ft	149
6 ft	72
TOTAL	786
NH4-N	93
ORGANIC	1.9

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	50	0	434	0	0	0	484
2014	0	0	391	0	0	0	391
2013	0	0	434	0	0	0	434
2012	0	0	435	0	0	0	435

Comments

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition
Triticale	6 Tons			Good Actual
Triticale	6 Tons	Corn Silage	28 Tons	
Triticale	6 Tons	Corn Silage	28 Tons	
Triticale	6 Tons	Corn Silage	28 Tons	

Soil 173 - Warden Fine Sandy Loam 2-5% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S-SH	D-M	3.2	
B	S-SH	D-M	4.3	
C	S-SH	D-M	3.5	
D	S-SH	D-M		
E				

2038

Acres 17
Soil Testing? YES
Test Frequency Annually
Irrigation Type Wheel Lines
Irrigation Schedule Observe Crop
Hour Sets
Irrigation years 15

NO3 (#N/ACRE)	
4/28/2015	
1 ft	116
2 ft	137
3 ft	108
4 ft	45
5 ft	17
6 ft	7
TOTAL	430
NH4-N	44
ORGANIC	3.46

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	40	0	0	0	0	0	40
2014	120	0	0	0	0	0	120
2013	150	0	0	0	0	0	150
2012	150	0	0	0	0	0	150

Comments

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition
Triticale	6 Tons			Good Actual
Triticale	6 Tons			
Triticale	6 Tons			
Triticale	6 Tons			

Soil 140 - Sinloc Silt Loam 2-5% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S, SH, SH	D-M, M, M	2.3	4
B	S, SH, SH	D-M, M, M	2.2	
C	S, SH, SH, SH	D-M, M, Dp, Dp	2.5	
D	S, SH, SH	D-M, M, Dp		
E				

LOWER YAKIMA VALLEY GROUNDWATER ADVISORY COMMITTEE — Groundwater Management Area (GWMA)

Deep Soil Sampling - Spring 2015

2039

Acres 40
Soil Testing? YES
Test Frequency Annually
Irrigation Type Pivot
Irrigation Schedule Observe Crop
Hour Sets
Irrigation years 2

NO3 (#N/ACRE)	4/29/2015
1 ft	45
2 ft	104
3 ft	93
4 ft	131
5 ft	314
6 ft	360
TOTAL	1047
NH4-N	13
ORGANIC	2.12

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0

Comments

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
				Good	Actual
Alfalfa	8 Tons				
Alfalfa	8.5 Tons				
Alfalfa	8.5 Tons				

Soil 172 - Warden Fine Sandy Loam 0-2% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	D-M	3.5	
B	S, SH	D-M, M	3.5	
C	S, SH, SH	D-M, M, M	4.9	
D	S, SH	D-M, M	5.6	
E				

2040

Acres 33
Soil Testing? YES
Test Frequency Biannually
Irrigation Type Pivot
Irrigation Schedule Shovel Method
Hour Sets
Irrigation years 15

NO3 (#N/ACRE)	4/29/2015
1 ft	41
2 ft	25
3 ft	13
4 ft	36
5 ft	88
6 ft	68
TOTAL	271
NH4-N	26
ORGANIC	3.09

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0

Comments LIQUID APPLIED THRU PIVOT

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
				Good	Actual
Triticale	8.79 Tons	Corn Silage	26 Tons		
Triticale	8.85 Tons	Corn Silage	22 Tons		
Triticale	7.6 Tons	Corn Silage	25 Tons		

Soil 172 - Warden Fine Sandy Loam 0-2% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S, S, SH	D, M, M	3.6	
B	S, S, S, SH	D, M, D, M	4.8	
C	S, SH, S	D, M, M	5.9	
D	S	M	3.8	
E				

2041

Acres 72
Soil Testing? YES
Test Frequency Biannually
Irrigation Type Pivot
Irrigation Schedule Shovel Method
Hour Sets
Irrigation years 7

NO3 (#N/ACRE)	4/29/2015
1 ft	4
2 ft	3
3 ft	3
4 ft	4
5 ft	6
6 ft	12
TOTAL	32
NH4-N	9
ORGANIC	1.46

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0

Comments Liquid is injected

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
				Good	Actual
Triticale	6.94 Tons	Corn Silage	24.24		
Triticale	10.33 Tons	Corn Silage	30.57		
Triticale	9.6 Tons	Corn Silage	30.16		

Soil 172 - Warden Fine Sandy Loam 0-2% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	D	4.5	
B	S	D	3	
C	S	D	3.6	
D	S	D		
E				

2042

Acres 18
Soil Testing? YES
Test Frequency Annually
Irrigation Type Wheel Lines
Irrigation Schedule Soil Moisture Sensors
Hour Sets 12
Irrigation years 20

NO3 (#N/ACRE)	4/29/2015
1 ft	29
2 ft	28
3 ft	12
4 ft	7
5 ft	8
6 ft	5
TOTAL	89
NH4-N	32
ORGANIC	2.03

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0

Comments NO NITROGEN APPLIED OF ANY KIND LAST 3 YEARS

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
				Poor	Planned
Alfalfa	7 Tons				
Alfalfa	2 Tons				
Triticale	5 Tons	Sudan Grass	5 Tons		
Triticale	5 Tons	Sudan Grass	5 Tons		

Soil 138 - Sinloc Fine Sandy Loam 0-2% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	M	3.7	
B	S	M	2.8	
C	S	M	3	
D	S	M	3.9	
E				

LOWER YAKIMA VALLEY GROUNDWATER ADVISORY COMMITTEE — Groundwater Management Area (GWMA)

Deep Soil Sampling - Spring 2015

2043

Acres	40
Soil Testing?	YES
Test Frequency	Annually
Irrigation Type	Wheel Lines
Irrigation Schedule	Routine Schedule
Hour Sets	24
Irrigation years	20

NO3 (#N/ACRE)	
4/29/2015	
1 ft	32
2 ft	16
3 ft	6
4 ft	3
5 ft	13
6 ft	16
TOTAL	86
NH4-N	35
ORGANIC	3.09

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0

Comments

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
Alfalfa	6 Tons			Good	Planned
Alfalfa	8 Tons				
Alfalfa	3.5 Tons				
Triticale	5 Tons				

Soil 138 - Sinloc Fine Sandy Loam 0-2% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S, S, S, S	M, Dp, W, W	1.9	
B	S, S, S	M, Dp, W	3.7	
C	S, S, S	M, Dp, W	2.6	
D	S, S, S	M, Dp, W	2.7	
E				

2044

Acres	33
Soil Testing?	YES
Test Frequency	Annually
Irrigation Type	
Irrigation Schedule	Routine Schedule
Hour Sets	24
Irrigation years	

NO3 (#N/ACRE)	
4/30/2015	
1 ft	29
2 ft	152
3 ft	457
4 ft	623
5 ft	706
6 ft	409
TOTAL	2376
NH4-N	31
ORGANIC	3.4

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0

Comments — No Nutrients added during last 4 years

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
Alfalfa	8 Tons			Good	Planned
Alfalfa	7 Tons				
Alfalfa	9 Tons				
Alfalfa	6 Tons				

Soil 92 - Outlook Silt Loam

Hole	Consistency	Moisture	Roots	Refusal
A	S	M	2.9	
B	S	M	1.5	
C	S	M	5	
D	S	M	5.4	
E				

2045

Acres	44
Soil Testing?	YES
Test Frequency	Annually
Irrigation Type	Wheel Lines
Irrigation Schedule	Routine Schedule
Hour Sets	24
Irrigation years	20

NO3 (#N/ACRE)	
4/30/2015	
1 ft	29
2 ft	4
3 ft	20
4 ft	22
5 ft	13
6 ft	31
TOTAL	119
NH4-N	25
ORGANIC	2.37

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0

Comments — *No nutrients added since fall of 2011*

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
Alfalfa	8 Tons			Good	Planned
Alfalfa	7.6 Tons				
Alfalfa	8.83 Tons				
Alfalfa	5.18 Tons				

Soil 138 - Sinloc Fine Sandy Loam 0-2% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S, S, SH, S	D, M, M, M	3.1	
B	S, S, SH, S	D, M, M, M	3	
C	S, S, SH, S	D, M, M, M	3.4	
D	S, S, SH, S, SH, S	D, M, M, M, M, M	4.7	
E				

2046

Acres	
Soil Testing?	YES
Test Frequency	Annually
Irrigation Type	Wheel Lines
Irrigation Schedule	Routine Schedule
Hour Sets	24
Irrigation years	20

NO3 (#N/ACRE)	
4/30/2015	
1 ft	36
2 ft	88
3 ft	95
4 ft	70
5 ft	65
6 ft	72
TOTAL	426
NH4-N	33
ORGANIC	2.67

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	100	0	0	0	0	100
2014	0	500	0	0	0	0	500
2013	0	500	0	0	0	0	500
2012	0	500	0	0	0	0	500

Comments

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
Triticale	5 Tons			Fair	Planned
Triticale	5 Tons	Sudan Grass	10 Tons		
Triticale	5 Tons	Sudan Grass	10 Tons		
Triticale	5 Tons	Sudan Grass	10 Tons		

Soil 139 - Sinloc Silt Loam 0-2% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S, S, SH, S	D, M, M, M	2.9	
B	S, S, SH, S	D, M, M, M	1.8	
C	S, S, SH, S	D, M, M, M	1.9	
D	S, S, SH	D, M, M	1.3	
E				

Deep Soil Sampling - Spring 2015

2047

Acres 45
Soil Testing? YES
Test Frequency Annually
Irrigation Type Pivot
Irrigation Schedule Routine Schedule
Hour Sets 120
Irrigation years 10

NO3 (#N/ACRE)	
4/30/2015	
1 ft	113
2 ft	466
3 ft	913
4 ft	951
5 ft	626
6 ft	252
TOTAL	3321
NH4-N	21
ORGANIC	3.11

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	150	0	0	0	0	0	150
2014	300	0	0	0	0	0	300
2013	300	0	0	0	0	0	300
2012	300	0	0	0	0	0	300

Comments

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
Alfalfa	10 Tons			Fair	Planned
Alfalfa	9 Tons				
Alfalfa	9.5 Tons				
Alfalfa	5.5 Tons				

Soil 178 - Warden Silt Loam 5-8% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	SH, SH, SH, SH, S, SH	M, M, M, M, D, M	5.9	
B	SH, SH, SH, S	M, M, M, D	5.3	
C	SH	M	2	2
D	SH	M	2	3
E				

2048

Acres 150
Soil Testing? YES
Test Frequency Annually
Irrigation Type Wheel Lines
Irrigation Schedule Routine Schedule
Hour Sets 12
Irrigation years 15

NO3 (#N/ACRE)	
4/30/2015	
1 ft	144
2 ft	73
3 ft	
4 ft	
5 ft	
6 ft	
TOTAL	217
NH4-N	17
ORGANIC	3.51

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0

Comments: Liquid Manure was applied twice per year. Records are unavailable for #/acre of N

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
Triticale	4.7 Tons			Good	Actual
Alfalfa	7 Tons				
Alfalfa	7 Tons				
Alfalfa	7 Tons				

Soil 120 - Scoon Silt Loam 2-5% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	M	1.6	1.6
B	S	M	1.4	1.5
C	S	M	1.4	1.5
D	S	M	1.7	1.8
E				

2049

Acres 35
Soil Testing? YES
Test Frequency Annually
Irrigation Type Pivot
Irrigation Schedule Routine Schedule
Hour Sets DAILY
Irrigation years 1

NO3 (#N/ACRE)	
5/3/2015	
1 ft	84
2 ft	8
3 ft	11
4 ft	8
5 ft	45
6 ft	8
TOTAL	164
NH4-N	19
ORGANIC	1.55

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	0	0	0	0	0
2014	0	0	50	0	0	0	50
2013	0	0	60	0	0	0	60
2012	0	0	45	0	0	0	45

Comments

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
				Good	Planned
Corn Grain	8 Tons				
Corn Silage	8 Tons				
Corn Silage	28 Tons				

Soil 177 - Warden Silt Loam 2-5% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	M	4.7	
B	S	M	4.2	
C	S	M	5.9	
D	S	M	4.2	
E				

2050

Acres 55
Soil Testing? YES
Test Frequency Biannually
Irrigation Type Pivot
Irrigation Schedule Routine Schedule
Hour Sets
Irrigation years 8

NO3 (#N/ACRE)	
5/3/2015	
1 ft	18
2 ft	9
3 ft	21
4 ft	43
5 ft	61
6 ft	51
TOTAL	203
NH4-N	25
ORGANIC	2.95

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	0	0	0	0	0
2014	0	0	80	0	0	0	80
2013	0	0	0	0	0	0	0
2012	0	0	45	0	0	0	45

Comments

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
Triticale	8 Tons			Good	Actual
Triticale	8 Tons	Corn Silage	30		
Triticale	8 Tons	Corn Silage	30		
Triticale	8 Tons	Corn Silage	30		

Soil 177 - Warden Silt Loam 2-5% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	M	2.2	4
B	S	M	2.7	4
C	S	M	5.3	
D	S	M	3.4	
E				

LOWER YAKIMA VALLEY GROUNDWATER ADVISORY COMMITTEE — Groundwater Management Area (GWMA)

Deep Soil Sampling - Spring 2015

2051

Acres	50
Soil Testing?	YES
Test Frequency	Biannually
Irrigation Type	Wheel Lines
Irrigation Schedule	Routine Schedule
Hour Sets	Daily
Irrigation years	

NO3 (#N/ACRE) 5/3/2015	
1 ft	14
2 ft	3
3 ft	3
4 ft	3
5 ft	3
6 ft	3
TOTAL	29
NH4-N	25
ORGANIC	2.32

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	75	0	0	0	75
2014	0	0	180	0	0	0	180
2013	0	0	150	0	0	0	150
2012	0	0	135	0	0	0	135

Comments

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition
Pasture				Good
Pasture				
Pasture				
Pasture				

Soil 140 - Sinloc Silt Loam 2-5% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	M	3.4	
B	S	M	4.2	
C	S	M	4.4	
D	S	M	4.3	
E				

2052

Acres	130
Soil Testing?	YES
Test Frequency	Annually
Irrigation Type	Pivot
Irrigation Schedule	Shovel Method
Hour Sets	
Irrigation years	12

NO3 (#N/ACRE) 5/3/2015	
1 ft	59
2 ft	
3 ft	
4 ft	
5 ft	
6 ft	
TOTAL	59
NH4-N	16
ORGANIC	2.16

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	0	0	0	0	0
2014	400	0	0	0	0	0	400
2013	400	0	0	0	0	0	400
2012	400	0	0	0	0	0	400

Comments: Nutrients applied thru pivot

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
Triticale	7 Tons			Good	Actual
Triticale	5.5 Tons	Corn Silage	29 Tons		
Triticale	6 Tons	Corn Silage	31 Tons		
Triticale	6 Tons	Corn Silage	26 Tons		

Soil 120 - Scoon Silt Loam 2-5% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	D	1	1
B	S	D	1.2	1.2
C	S	D	0.8	1
D	S	D		1
E				

2053

Acres	110
Soil Testing?	YES
Test Frequency	Annually
Irrigation Type	Pivot
Irrigation Schedule	Shovel Method
Hour Sets	
Irrigation years	15

NO3 (#N/ACRE) 5/3/2015	
1 ft	84
2 ft	58
3 ft	
4 ft	
5 ft	
6 ft	
TOTAL	142
NH4-N	11
ORGANIC	1.59

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	0	0	0	0	0
2014	400	0	0	0	0	0	400
2013	400	0	0	0	0	0	400
2012	400	0	0	0	0	0	400

Comments: Nutrients applied thru pivot

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
Triticale	7 Tons			Good	Actual
Triticale	6 Tons	Corn Silage	29 Tons		
Triticale	6 Tons	Corn Silage	31 Tons		
Triticale	6 Tons	Corn Silage	26 Tons		

Soil 122 - Scoon Silt Loam 8-15% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	D	0.9	1
B	S	D	1.5	1.5
C	S	D	1.5	1.5
D	S	D	1	1
E				

2054

Acres	15
Soil Testing?	YES
Test Frequency	Annually
Irrigation Type	Solid Set Above Canopy
Irrigation Schedule	Routine Schedule
Hour Sets	24
Irrigation years	15

NO3 (#N/ACRE) 5/3/2015	
1 ft	133
2 ft	40
3 ft	
4 ft	
5 ft	
6 ft	
TOTAL	173
NH4-N	22
ORGANIC	2.52

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	240	0	0	0	0	0	240
2014	200	0	0	0	0	0	200
2013	200	0	100	0	0	0	300
2012	0	0	0	0	0	0	0

Comments

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
Wheat	110 Bushels			Good	Planned
Corn	35 Bushels				
Alfalfa	2.5 Tons	Corn	32 Tons		
Alfalfa	8.55 Tons				

Soil 132 - Shano Silt Loam 2-5% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	M	2	2
B	S	M	1.9	2
C	S	M	1.9	2
D	S	M	2	2
E				

LOWER YAKIMA VALLEY GROUNDWATER ADVISORY COMMITTEE — Groundwater Management Area (GWMA)

Deep Soil Sampling - Spring 2015

2055

Acres	15
Soil Testing?	YES
Test Frequency	Annually
Irrigation Type	Solid Set Above Canopy
Irrigation Schedule	Routine Schedule
Hour Sets	24
Irrigation years	15

NO3 (#N/ACRE) 5/3/2015

1 ft	75
2 ft	
3 ft	
4 ft	
5 ft	
6 ft	
TOTAL	75
NH4-N	62
ORGANIC	4.24

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	240	0	0	0	0	0	240
2014	200	0	0	0	0	0	200
2013	200	0	100	0	0	0	300
2012	0	0	0	0	0	0	0

Comments

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
Wheat	110 Bushels			Good	Planned
Corn Silage	35 Tons				
Alfalfa	2.5 Tons	Corn Silage	32 Tons		
Alfalfa	8.5 Tons				

Soil 120 - Scoon Silt Loam 2-5% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	M	1	1
B	S	M	0.8	1
C	S	M	0.7	0.9
D	S	M	0.9	0.9
E				

2056

Acres	40
Soil Testing?	YES
Test Frequency	Annually in Fall
Irrigation Type	Wheel Lines
Irrigation Schedule	Shovel Method
Hour Sets	12-24
Irrigation years	11

NO3 (#N/ACRE) 5/3/2015

1 ft	25
2 ft	151
3 ft	50
4 ft	14
5 ft	8
6 ft	10
TOTAL	258
NH4-N	21
ORGANIC	2.39

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	60	0	0	0	60
2014	0	0	50	0	0	0	50
2013	0	0	50	0	0	0	50
2012	0	0	0	0	0	0	0

Comments

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
Triticale	7 Tons			Good	Actual
Squash					
Squash					

Soil 177 - Warden Silt Loam 2-5% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	M	3.2	
B	S	M	4.2	
C	S	M	2.5	
D	S	M	3.2	
E				

2057

Acres	12
Soil Testing?	YES
Test Frequency	
Irrigation Type	Drip
Irrigation Schedule	Routine Schedule
Hour Sets	
Irrigation years	

NO3 (#N/ACRE) 5/3/2015

1 ft	37
2 ft	21
3 ft	21
4 ft	3
5 ft	
6 ft	
TOTAL	82
NH4-N	10
ORGANIC	1.03

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0

Comments No Nutrients Applied

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
Wine Grapes	5 Tons			Fair	Planned
Wine Grapes	5 Tons				
Wine Grapes	2.5 Tons				

Soil 132 - Shano Lilt Loan 2-5% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	M	3.6	4
B	S	M	4	4
C	S	M	3.3	3.8
D	S	M	3.7	3.7
E				

2058

Acres	35
Soil Testing?	YES
Test Frequency	Annually
Irrigation Type	Pivot
Irrigation Schedule	Routine Schedule
Hour Sets	
Irrigation years	15

NO3 (#N/ACRE) 5/3/2015

1 ft	119
2 ft	986
3 ft	892
4 ft	694
5 ft	407
6 ft	287
TOTAL	3385
NH4-N	16
ORGANIC	1.92

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	270	0	0	0	0	0	270
2014	342	0	0	0	0	0	342
2013	342	0	0	0	0	0	342
2012	342	0	0	0	0	0	342

Comments

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
Triticale	7 Tons			Good	Actual
Triticale	7 Tons	Corn Silage	25 Tons		
Triticale	7 Tons	Corn Silage	27 Tons		
Triticale	6 Tons	Corn Silage	27 Tons		

Soil 174 - Warden Fine Sandy Loam 5-8% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	M	3.8	
B	S	M	4.2	
C	S, S, SH	M, M, M	3.3	
D	S, S, SH, S	M, M, M, M	4.7	
E				

LOWER YAKIMA VALLEY GROUNDWATER ADVISORY COMMITTEE — Groundwater Management Area (GWMA)

Deep Soil Sampling - Spring 2015

2059

Acres 41
Soil Testing? YES
Test Frequency Annually
Irrigation Type Pivot
Irrigation Schedule
Hour Sets
Irrigation years 1

NO3 (#N/ACRE) 5/5/2015	
1 ft	33
2 ft	23
3 ft	28
4 ft	18
5 ft	
6 ft	
TOTAL	102
NH4-N	9
ORGANIC	2.83

Comments

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	40	0	0	0	40
2014	0	0	260	0	0	0	260
2013	0	0	200	0	0	0	200
2012	0	0	250	0	0	342	592

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition
Triticale	6.5 Tons			Good Actual
Corn	33.1 Tons			
Corn	29 Tons			
Corn	31.4 Tons			

Soil 37 - Finley Silt Loam 0-2% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S, S, S	M, D, D	1.7	1.7
B	S, S, S, S,	M, D, D, D	2.5	4
C	S, S, S	M, D, D	1.3	1.7
D	S, S, S, S,	M, D, D, D	2.7	4
E				

2060

Acres 19
Soil Testing? YES
Test Frequency Annually
Irrigation Type Rill Irrigation
Irrigation Schedule Routine Schedule
Hour Sets 24
Irrigation years

NO3 (#N/ACRE) 5/5/2015	
1 ft	171
2 ft	50
3 ft	201
4 ft	24
5 ft	68
6 ft	7
TOTAL	521
NH4-N	6
ORGANIC	1.72

Comments

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	0	0	0	0	0
2014	0	0	225	0	0	0	225
2013	0	0	240	0	0	0	240
2012	0	0	275	0	0	0	275

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition
				Good Planned
Corn	30 Tons			
Corn	32 Tons			
Mint	68 Lbs.			

Soil 18 - Cleman Very Fine Sandy Loam 0-2% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	M	3.3	
B	S, S, S, S, S, S	M, M, M, M, Dp, M	2.6	
C	S, S, S, S, S, S	M, M, M, M, Dp, M	2.7	
D	S, S, SH, S, SH, S	M, M, M, M, M, M	1.6	
E				

2061

Acres
Soil Testing?
Test Frequency
Irrigation Type
Irrigation Schedule
Hour Sets
Irrigation years

NO3 (#N/ACRE) 5/5/2015	
1 ft	5
2 ft	3
3 ft	10
4 ft	4
5 ft	
6 ft	
TOTAL	22
NH4-N	9
ORGANIC	1.78

Comments

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition

Soil 125 - Scooteney Silt Loam 2-5% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	D	1.5	4
B	S	D	1.8	3.9
C	S	D	1.6	4
D	S	D	1.6	3.8
E				

2062

Acres
Soil Testing?
Test Frequency
Irrigation Type
Irrigation Schedule
Hour Sets
Irrigation years

NO3 (#N/ACRE) 5/5/2015	
1 ft	5
2 ft	6
3 ft	11
4 ft	14
5 ft	10
6 ft	
TOTAL	46
NH4-N	7
ORGANIC	0.84

Comments

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition

Soil 95 - Quincy Loamy Fine Sand 0-10% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	D	1	4
B	S, SH	D, M	1.2	3.9
C	S	D	2.9	5.2
D	S	D	1.1	4
E				

LOWER YAKIMA VALLEY GROUNDWATER ADVISORY COMMITTEE — Groundwater Management Area (GWMA)

Deep Soil Sampling - Spring 2015

2063

Acres 69
Soil Testing? YES
Test Frequency Annually
Irrigation Type Pivot
Irrigation Schedule
Hour Sets
Irrigation years 10

NO3 (#N/ACRE)	5/5/2015
1 ft	227
2 ft	337
3 ft	424
4 ft	528
5 ft	
6 ft	
TOTAL	1516
NH4-N	24
ORGANIC	3.94

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	306	0	0	0	0	306
2014	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0

Comments: No manure applied for last 3 years. In 2012 accidental over application of commecial nitrogen caused excess N in soil.

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
Triticale	5 Tons	Corn Silage	35 Tons	Good	Planned
Triticale	5 Tons	Corn Silage	31 Tons		
Triticale	5 Tons	Corn Silage	31 Tons		

Soil 142 - Starbuck Silt Loam 2-15% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S, S, SH	D, D, M	3.8	4
B	S, S, SH	D, D, M	1.9	4
C	S, S, SH	D, D, M	2.6	4.1
D	S, S, SH	D, D, M	3.5	4
E				

2064

Acres 30
Soil Testing? YES
Test Frequency Annually
Irrigation Type Pivot
Irrigation Schedule Observe Crop
Hour Sets
Irrigation years 10

NO3 (#N/ACRE)	5/5/2015
1 ft	52
2 ft	26
3 ft	43
4 ft	26
5 ft	
6 ft	
TOTAL	147
NH4-N	19
ORGANIC	3.21

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	324	0	0	0	0	0	324
2014	63	0	0	0	0	0	63
2013	63	0	0	0	0	0	63
2012	63	0	0	0	0	0	63

Comments

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
Triticale	6 Tons	Corn Silage	35 Tons	Good	Planned
Triticale	6 Tons	Corn Silage	33 Tons		
Triticale	6 Tons	Corn Silage	33 Tons		

Soil 142 - Starbuck Silt Loam 2-15% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	M	3.1	4
B	S	M	3	3.9
C	S	M	3.6	4.2
D	S	M	3.6	4
E				

2065

Acres 30
Soil Testing? YES
Test Frequency Biannually
Irrigation Type Pivot
Irrigation Schedule Soil Moisture Sensors
Hour Sets
Irrigation years 15

NO3 (#N/ACRE)	5/6/2015
1 ft	213
2 ft	304
3 ft	
4 ft	
5 ft	
6 ft	
TOTAL	517
NH4-N	15
ORGANIC	2.59

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	225	0	0	0	0	0	225
2014	475	0	75	0	0	0	550
2013	475	0	100	0	0	0	575
2012	390	0	100	0	0	0	490

Comments

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
Triticale	10 Tons			Good	Actual
Triticale	10 Tons	Corn Silage	33 Tons		
Triticale	10 Tons	Corn Silage	35 Tons		
Triticale	12 Tons	Corn Silage	33 Tons		

Soil 58 - Hezel Loamy Fine Sand 2-15% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S, S	M, D	2	2
B	S, S	M, D	1.9	1.9
C	S	M	2	2
D	S	M	2	2
E				

2066

Acres 155
Soil Testing? YES
Test Frequency Biannually
Irrigation Type Pivot
Irrigation Schedule Soil Moisture Sensors
Hour Sets
Irrigation years 9

NO3 (#N/ACRE)	5/8/2015
1 ft	44
2 ft	182
3 ft	193
4 ft	
5 ft	
6 ft	
TOTAL	419
NH4-N	24
ORGANIC	3.23

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	200	0	0	0	0	0	200
2014	450	0	0	0	0	0	450
2013	425	0	0	0	0	0	425
2012	450	0	50	0	0	0	500

Comments

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
Triticale	8 Tons			Good	Actual
Triticale	8 Tons	Corn Silage	30 Tons		
Triticale	9 Tons	Corn Silage	29 Tons		
Triticale	7 Tons	Corn Silage	26 Tons		

Soil 120 - Scoon Silt Loam 2-5% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	D-M	2	2
B	S	D-M	2	2
C	S	D-M	2.8	2.9
D	S	D-M	1.6	1.7
E				

LOWER YAKIMA VALLEY GROUNDWATER ADVISORY COMMITTEE — Groundwater Management Area (GWMA)

Deep Soil Sampling - Spring 2015

2067

Acres 83
Soil Testing? YES
Test Frequency Biannually
Irrigation Type Pivot
Irrigation Schedule Soil Moisture Sensors
Hour Sets
Irrigation years 7

NO3 (#N/ACRE) 5/8/2015	
1 ft	19
2 ft	97
3 ft	197
4 ft	115
5 ft	40
6 ft	27
TOTAL	495
NH4-N	18
ORGANIC	1.56

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	90	0	0	0	90
2014	180	0	200	0	0	0	380
2013	180	0	200	0	0	0	380
2012	20	0	200	0	0	0	220

Comments

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition
Triticale	7 Tons			Good Actual
Triticale	7 Tons	Corn Silage	32 Tons	
Triticale	10 Tons	Corn Silage	31 Tons	
Triticale	7 Tons	Corn Silage	25 Tons	

Soil 177 - Warden Silt Loam 2-5% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S, S, S, S, S, S, S, S	D, D-M, M, D-M, M, M, D-M, M	5.3	
B	S, S, S, S, S, S	D, D-M, M, D-M, M, M	3.9	
C	S, S, S, S, S, S	D, D-M, M, D-M, M, D-M	4.1	
D	S, S, S, S, SH, S, S, S, S	D-M, M, D-M, M, D-M, M, D-M	5.3	
E				

2068

Acres 75
Soil Testing? YES
Test Frequency Biannually
Irrigation Type Pivot
Irrigation Schedule Soil Moisture Sensors
Hour Sets
Irrigation years 9

NO3 (#N/ACRE) 5/8/2015	
1 ft	7
2 ft	35
3 ft	137
4 ft	115
5 ft	
6 ft	
TOTAL	294
NH4-N	13
ORGANIC	1.71

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	250	0	0	0	0	0	250
2014	0	0	75	0	0	0	75
2013	240	0	150	0	0	0	390
2012	250	0	175	0	0	0	425

Comments

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition
Triticale	7 Tons			Good Actual
Triticale	7 Tons	Corn Silage	31 Tons	
Triticale	7 Tons	Corn Silage	31 Tons	
Triticale	7 Tons	Corn Silage	29 Tons	

Soil 58 - Hezel Loamy Fine Sand 2-15% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S, S, S, S,	D, M, M, M	3	4
B	S	M	3	4
C	S	M	2.5	4
D	S	M	3	4
E				

2069

Acres 83
Soil Testing? YES
Test Frequency Biannually
Irrigation Type Linear Move
Irrigation Schedule Routine Schedule 1 inch every 3 to 4 days
Hour Sets
Irrigation years 10

NO3 (#N/ACRE) 5/8/2015	
1 ft	24
2 ft	9
3 ft	
4 ft	
5 ft	
6 ft	
TOTAL	33
NH4-N	22
ORGANIC	2.17

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	0	0	0	0	0
2014	164	0	0	0	0	0	164
2013	0	315	70	0	0	0	385
2012	0	0	150	0	0	0	150

Comments

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition
Alfalfa	8.5 Tons			Good Planned
Alfalfa	7 Tons	Corn Silage	35 Tons	
Triticale	12 Tons	Corn Silage	35 Tons	
Triticale	12 Tons			

Soil 177 - Warden Silt Loam 2-5% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	M	2	2
B	S	M	1	1
C	S	M	2	2
D	S	M	1.9	1.9
E				

2070

Acres 110
Soil Testing? YES
Test Frequency Biannually
Irrigation Type Linear Move
Irrigation Schedule Routine Schedule 1 inch every 3 to 4 days
Hour Sets
Irrigation years 10

NO3 (#N/ACRE) 5/8/2015	
1 ft	37
2 ft	26
3 ft	63
4 ft	83
5 ft	51
6 ft	38
TOTAL	298
NH4-N	9
ORGANIC	0.98

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	60	0	100	0	0	0	160
2014	60	135	100	0	0	0	295
2013	0	0	270	0	0	0	270
2012	0	132	0	0	0	0	132

Comments: Commercial N put through pivot throughout the year.

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition
Triticale	15 Tons			Good Actual
Triticale	15 Tons	Corn Silage	35 Tons	
Triticale	15 Tons	Corn Silage	35 Tons	
Triticale	15 Tons	Corn Silage	35 Tons	

Soil 19 - Cleman Very Fine Sandy Loam 2-5% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S, S, S	M, D, D	6	
B	S, S, S, S,	M, D, D, D	5.8	
C	S	M	5.8	
D	S	M	5.6	
E				

LOWER YAKIMA VALLEY GROUNDWATER ADVISORY COMMITTEE — Groundwater Management Area (GWMA)

Deep Soil Sampling - Spring 2015

2071

Acres 35
Soil Testing? YES
Test Frequency Biannually
Irrigation Type Pivot
Irrigation Schedule Routine Schedule
Hour Sets
Irrigation years

NO3 (#N/ACRE)	5/8/2015
1 ft	41
2 ft	68
3 ft	31
4 ft	36
5 ft	77
6 ft	100
TOTAL	353
NH4-N	16
ORGANIC	1.34

Comments

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	150	0	0	0	0	0	150
2014	150	0	80	0	0	0	230
2013	150	0	0	0	0	0	150
2012	150	0	100	0	0	0	250

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
Alfalfa	10 Tons			Good	Planned
Corn Silage	35 Tons				
Alfalfa	10 Tons				
Triticale and	22 Tons				

Soil 58 - Hezel Loamy Fine Sand 2-15% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	M	2	4
B	S	M	3	4
C	S	M	3	4
D	S	M	4	
E				

2072

Acres 40
Soil Testing? YES
Test Frequency Biannually
Irrigation Type Wheel Lines
Irrigation Schedule Routine Schedule
Hour Sets 12
Irrigation years

NO3 (#N/ACRE)	5/8/2015
1 ft	39
2 ft	20
3 ft	21
4 ft	15
5 ft	21
6 ft	24
TOTAL	140
NH4-N	19
ORGANIC	1.03

Comments

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	45	0	0	0	0	0	45
2014	100	0	0	0	0	0	100
2013	150	0	0	0	0	0	150
2012	100	0	0	0	0	0	100

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
Alfalfa	10 Tons			Good	Planned
Alfalfa	8.8 Tons				
Grass	21 Tons				
Grass	20 Tons				

Soil 58 - Hezel Loamy Fine Sand 2-15% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	M	3	3.2
B	S	M	3.5	3.5
C	S	M	6	
D	S	M	3	3
E				

2073

Acres 120
Soil Testing? YES
Test Frequency Biannually
Irrigation Type Pivot
Irrigation Schedule Routine Schedule
Hour Sets
Irrigation years

NO3 (#N/ACRE)	5/8/2015
1 ft	36
2 ft	35
3 ft	31
4 ft	38
5 ft	
6 ft	
TOTAL	140
NH4-N	27
ORGANIC	2.42

Comments

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
Alfalfa	10 Tons			Good	Planned
Alfalfa	9 Tons				
Alfalfa	10 Tons				
Alfalfa	10 Tons				

Soil 179 - Warden Silt Loam 8-15% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S, S, S	M, M, D	3.2	3.4
B	S, S, S	M, M, D	2.4	2.9
C	S, S, S	M, M, D	3.3	3.5
D	S, S, S	M, M, D	3.1	3.9
E				

2074

Acres 20
Soil Testing? Yes
Test Frequency Annually
Irrigation Type Wheel Lines
Irrigation Schedule Soil Moisture Sensors
Hour Sets
Irrigation years

NO3 (#N/ACRE)	5/8/2015
1 ft	75
2 ft	55
3 ft	68
4 ft	97
5 ft	94
6 ft	26
TOTAL	415
NH4-N	26
ORGANIC	2.51

Comments

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition
Alfalfa	8 Tons			Good
Alfalfa	8 Tons			
Alfalfa	8 Tons			

Soil 37 - Finley Silt Loam 0-2% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	M	6	
B	S	M	3.7	
C	S	M	3.4	
D	S, S, SH, H	M, M, M, M	2.6	4.5
E				

LOWER YAKIMA VALLEY GROUNDWATER ADVISORY COMMITTEE — Groundwater Management Area (GWMA)

Deep Soil Sampling - Spring 2015

2075

Acres	30
Soil Testing?	YES
Test Frequency	Biannually
Irrigation Type	Big Gun
Irrigation Schedule	Shovel Method
Hour Sets	
Irrigation years	

NO3 (#N/ACRE)	5/8/2015
1 ft	160
2 ft	40
3 ft	
4 ft	
5 ft	
6 ft	
TOTAL	200
NH4-N	55
ORGANIC	2.72

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0

Comments: Nutrients applied with injector

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
Triticale	9.62 Tons			Good	Actual
Corn	25 Bushels				
Triticale	2.34 Tons				
Sudan Grass	7.33 Tons				

Soil: 40 - Finley Silt Loam 8-15% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	M	1	1
B	S	M	2	2
C	S	M	1.5	1.5
D	S, EH	M, M	1.2	2
E				

2076

Acres	37
Soil Testing?	YES
Test Frequency	Annually
Irrigation Type	Rill Irrigation
Irrigation Schedule	Routine Schedule
Hour Sets	24
Irrigation years	

NO3 (#N/ACRE)	5/8/2015
1 ft	182
2 ft	87
3 ft	150
4 ft	73
5 ft	248
6 ft	30
TOTAL	770
NH4-N	14
ORGANIC	1.49

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	0	0	0	0	0
2014	0	0	200	0	0	0	200
2013	0	0	200	0	0	0	200
2012	0	0	200	0	0	0	200

Comments:

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
				Good	Planned
Corn Silage	28.5 Tons				
Corn Silage	33 Tons				
Corn Silage	35 Tons				

Soil: 18 - Cleman Very Fine Sandy Loam 0-2% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	M	2	
B	S	M	2	
C	S	M	1.5	
D	S	M	1.5	
E				

2077

Acres	40
Soil Testing?	YES
Test Frequency	Biannually
Irrigation Type	Pivot
Irrigation Schedule	Observe Crop
Hour Sets	
Irrigation years	14

NO3 (#N/ACRE)	5/8/2015
1 ft	26
2 ft	22
3 ft	26
4 ft	25
5 ft	35
6 ft	41
TOTAL	175
NH4-N	16
ORGANIC	1.81

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	0	0	0	0	0
2014	0	0	100	0	0	0	100
2013	0	0	100	0	0	0	100
2012	0	0	100	0	0	0	100

Comments:

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
Triticale	8 Tons			Good	Planned
Triticale	6.25 Tons	Corn Silage	35 Tons		
Triticale	6 Tons	Corn Silage	35 Tons		

Soil: 95 - Quincy Loamy Fine Sand 0-10% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	M	3	
B	S	M	4	
C	S	M	3	
D	S	M	2	
E				

2078

Acres	40
Soil Testing?	YES
Test Frequency	Biannually
Irrigation Type	Pivot
Irrigation Schedule	shovel method
Hour Sets	
Irrigation years	14

NO3 (#N/ACRE)	5/8/2015
1 ft	49
2 ft	89
3 ft	86
4 ft	156
5 ft	172
6 ft	111
TOTAL	663
NH4-N	27
ORGANIC	2.62

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0		0	0	0	
2014	0	0	100	0	0	0	100
2013	0	0	100	0	0	0	100
2012	0	0	100	0	0	0	100

Comments:

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
Triticale	8 Tons			Good	Planned
Triticale	6.25 Tons	Corn Silage	35		
Triticale	6 Tons	Corn Silage	35		

Soil: 32 - Esquatzel Silt Loam 0-2%Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S, S, S	M, Dp, M	2.5	
B	S, S, S	M, Dp, M	2	
C	S, S, S, S, S	M, Dp, M, W, M	2.2	
D	S, S, S	M, Dp, W	1.5	
E				

LOWER YAKIMA VALLEY GROUNDWATER ADVISORY COMMITTEE — Groundwater Management Area (GWMA)

Deep Soil Sampling - Spring 2015

2079

Acres	55
Soil Testing?	YES
Test Frequency	Annually
Irrigation Type	Pivot
Irrigation Schedule	Visual in spring; routine in summer
Hour Sets	
Irrigation years	20

NO3 (#N/ACRE)	5/8/2015
1 ft	9
2 ft	66
3 ft	127
4 ft	173
5 ft	98
6 ft	108
TOTAL	581
NH4-N	17
ORGANIC	2.62

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	20	0	0	0	0	0	20
2014	20	0	250	0	0	0	270
2013	20	0	200	0	0	0	220
2012	20	0	200	0	0	0	220

Comments

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
Triticale	8 Tons			Good	Actual
Triticale	8 Tons	Corn Silage	30 Tons		
Triticale	8 Tons	Corn Silage	30 Tons		
Triticale	8 Tons	Corn Silage	30 Tons		

Soil 172 - Warden Fine Sandy Loam 0-2% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S, S, SH, S, S, SH	M, M, M, M, M, M	3.5	
B	S, S, SH	M, M, M	5.1	
C	S, S, SH	M, M, M	5.8	
D	S, S, S. SH, S, SH	M, M, M, M, M, M	5.2	
E				

2080

Acres	104
Soil Testing?	YES
Test Frequency	Annually
Irrigation Type	Pivot
Irrigation Schedule	Visual in spring; routine in summer
Hour Sets	
Irrigation years	15

NO3 (#N/ACRE)	5/8/2015
1 ft	15
2 ft	15
3 ft	27
4 ft	44
5 ft	
6 ft	
TOTAL	101
NH4-N	17
ORGANIC	2.63

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	35	0	0	0	0	0	35
2014	35	0	250	0	0	0	285
2013	35	0	200	0	0	0	235
2012	35	0	200	0	0	0	235

Comments

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
Triticale	8 Tons			Good	Actual
Triticale	8 Tons	Corn Silage	30 Tons		
Triticale	8 Tons	Corn Silage	30 Tons		
Triticale	8 Tons	Corn Silage	30 Tons		

Soil 172 - Warden Fine Sandy Loam 0-2% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	M	1.5	4
B	S	M	2	2
C	S	M	1.5	2
D	S	M	1.5	2
E				

2081

Acres	13
Soil Testing?	YES
Test Frequency	Biannually
Irrigation Type	Rill Irrigation and hand line
Irrigation Schedule	Routine Schedule
Hour Sets	12
Irrigation years	10

NO3 (#N/ACRE)	5/8/2015
1 ft	75
2 ft	48
3 ft	40
4 ft	42
5 ft	32
6 ft	24
TOTAL	261
NH4-N	35
ORGANIC	2.45

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	0	0	0	0	0
2014	457	0	0	0	0	0	457
2013	403	0	0	0	0	0	403
2012	367	0	0	0	0	0	367

Comments: N split applications; Rill used for corn in July and August. Hand lines rest of year.

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
Triticale	7 Tons			Good	Planned
Triticale	7 Tons	Corn Silage	29 Tons		
Triticale	7 Tons	Corn Silage	29 Tons		

Soil 18 - Cleman Very Fine Sandy Loam 0-2% Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S	M	2.5	
B	S	M	3.5	
C	S	M	3	
D	S	M	4	
E				

2082

Acres	57
Soil Testing?	YES
Test Frequency	Biannually
Irrigation Type	Rill Irrigation and hand line
Irrigation Schedule	Routine Schedule
Hour Sets	12
Irrigation years	10

NO3 (#N/ACRE)	5/8/2015
1 ft	41
2 ft	22
3 ft	55
4 ft	70
5 ft	58
6 ft	74
TOTAL	320
NH4-N	25
ORGANIC	3.36

Fertilzer Applications (#N/Acre)

Year	Liquid Manure	Solid Manure	Com.	Bio	Comp	Other	Total
2015	0	0	0	0	0	0	0
2014	370	0	0	0	0	0	370
2013	414	0	0	0	0	0	414
2012	571	0	0	0	0	0	571

Comments: N split applications; Rill used for corn in July and August. Hand lines rest of year.

Cropping History

Crop 1	Crop 1 Yield	Crop 2	Crop 2 Yield	Condition	
Triticale	7 Tons			Good	Planned
Triticale	7 Tons	Corn Silage	29 Tons		
Triticale	7 Tons	Corn Silage	29 Tons		

Soil 32 - Esquatzel Silt Loam 0-2%Slopes

Hole	Consistency	Moisture	Roots	Refusal
A	S, SH	M, Dp	1.8	
B	S, SH	M, Dp	2.5	
C	S, SH	M, Dp	2.8	
D	S, SH	M, Dp	2.5	
E				

Lower Yakima Valley Groundwater Management Program

Addressing Nitrates in the Lower Yakima Valley Groundwater Area

Report produced by the Lower Yakima Valley Groundwater Advisory Committee

LOWER YAKIMA VALLEY GROUNDWATER MANAGEMENT PROGRAM

Addressing Nitrates in the Lower Yakima Valley Groundwater Area

Executive Summary

Purpose

The purpose of the Lower Yakima Valley Advisory Committee is to reduce nitrate contamination concentrations in groundwater below state drinking water standards.

Table of Contents

LOWER YAKIMA VALLEY

GROUNDWATER ADVISORY COMMITTEE

Groundwater Management Area (GWMA):
The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards

May 2015

parcel #
name
address
city state zip

Dear Resident:

Thank you for participating in the 2014 Lower Yakima Valley Groundwater Management Area (LYV GWMA) High Risk Well Assessment Survey. A certified lab analyzed the water quality samples taken from your home or well during the survey. These samples included an inorganic sample for Nitrate and a bacteriological sample for Coliform.

We enclosed a copy of the lab results for your drinking water.

* The Nitrate level detected was fill in here mg/L. A score of 10 mg/L or greater indicates a high unacceptable nitrate level that exceeds the State Standard of 10.0 mg/L.
* The bacteria (Total Coliform) results were fill in here [satisfactory or unsatisfactory].

Because your Nitrate level is at 10.0 mg/L or above, we recommend you have your well tested every three months for nitrate. You should also consider installing a treatment system to remove excess nitrate or use bottled water for drinking and cooking if a member of your household is:

* An infant less than one year of age
* Pregnant
* May become pregnant or
* Has certain blood disorders

We also enclosed fact sheets on Nitrate, Coliform, and websites (links) that you may find helpful. These websites have more information about many drinking water contaminants, Maximum Contaminant Levels, treatment options, as well as proper maintenance for your well. For example:

* You may enter your results into the Ohio Watershed Interpretation Tool at (http://ohiowatersheds.osu.edu/well-educated-ohio/well-water-interpretation-tool) for a detailed explanation of your results for any drinking water contaminant sampled and possible treatment recommendations, or
* Go to Well Owner.org http://www.wellowner.org/water-quality/water-testing/, for information on private wells, recommended testing, treatment, maintenance, and so on.

Why was my well water tested for Nitrate and Coliform?
The Lower Yakima Valley Groundwater Advisory Committee (GWAC) is a multi agency and citizen-based group coordinating efforts to reduce nitrate contamination in drinking water in the Lower Yakima Valley. To learn more about the GWAC, please visit: http://www.yakimacounty.us/gwma/. Our interest in the study was to inform residents and homeowners served by private or shared wells in the Lower Yakima Valley of the potential health risks associated with their drinking water. We were also interested in gathering more information about the Nitrate level in your drinking water.

Can I be of more help?
Yes, and again we are very grateful for the assistance you have already given us. There is more funding available for doing more tests and surveys on homes served by private wells. Our interest is to get the word out to more residents of the Lower Yakima Valley. Please give us a call at (509) 574-2300 or email us at PSWebContacts@co.yakima.wa.us if you know a neighbor or friend in the area who is interested in having their well tested and the survey completed. As part of our effort to evaluate the levels of nitrate in the LYV, we may be looking for permanent ongoing monitoring sites. Please call at (509) 574-2300 if you want us to consider your well for part of this effort.

Sincerely,

J. Rand Elliott, Chairman
Lower Yakima Valley Groundwater Advisory Committee (GWAC)

Enclosures

VER YAKIMA VALLEY
ROUNDWATER
ADVISORY
COMMITTEE

Groundwater Management Area (GWMA):
The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards

Mayo, 2015

parcel #
name
address
city state zip

Estimado residente:

Gracias por su participación en la Encuesta de Evaluación de Pozos de Alto Riesgo del Área de Manejo de Agua Subterránea del Valle Bajo de Yakima (LYV GWMA), 2014. Un laboratorio certificado analizó la calidad de las muestras de agua que se tomaron de su casa o pozo durante la encuesta. Las muestras se sometieron a una muestra inorgánica para Nitrato y una muestra bacteriológica para Coliforme.

Adjuntamos en esta carta una copia de los resultados de laboratorio de su agua para beber.

* El nivel de Nitrato detectado fue de fill in here mg/L. Un resultado mayor de 10 mg/L indica niveles altos no aceptables de nitrato que exceden el estándar Estatal de 10.0 mg/L.

* Los resultados para bacteria (Coliforme Total) fueron Satisfactorios.

Debido a que su nivel de Nitrato se encuentra en los 10.0 mg/L o lo excede, le recomendamos que hagan pruebas a su pozo por Nitrato cada 3 meses. También, debería considerar la instalación de un sistema especial para retirar el exceso nitrato o el uso de agua embotellada para tomar y cocinar si en su hogar vive alguien con las siguientes condiciones:

* Infante menor a un año de edad
* Embarazo
* Pudiera embarazarse
* Algún trastorno sanguíneo

También adjuntamos hojas con factores acerca del Nitrato, Coliforme y sitios en el internet (enlaces) que pudieran ser útiles. Estos sitos en el internet tienen más información acerca de muchos contaminantes en el agua para beber, Niveles Máximos de Contaminación, opciones de tratamiento y también del mantenimiento apropiado de su pozo. Por ejemplo:

* Para obtener una explicación detallada de sus resultados para cualquier contaminante al que se le haya echo la prueba a su agua para beber y recomendaciones para un tratamiento posible, usted puede ingresar sus resultados en la Ohio Watershed Interpretation Tool en: (http://ohiowatersheds.osu.edu/well-educated-ohio/well-water-interpretation-tool), o

* Para información sobre pozos privados, pruebas que se recomiendan, tratamientos y mantenimiento vaya a Well Owner.org http://www.wellowner.org/water-quality/water-testing/.

¿Por qué se hicieron pruebas por Nitrato y Coliforme al agua de mi pozo?
El grupo GWAC del Valle Bajo de Yakima es un grupo formado de varias agencias y ciudadanos que está coordinando esfuerzos para reducir la contaminación por nitrato en el agua para beber en el Valle Bajo de Yakima. Para más

información acerca de GWAC, por favor visite: http://www.yakimacounty.us/gwma/. Nuestro interés en el estudio fue informar a los residentes y propietarios de casas que usan el agua de pozos privados o compartidos en el Valle Bajo de Yakima de los riesgos potenciales de salud asociados con su agua para beber. También estamos interesados en reunir más información sobre el nivel de Nitrato en su agua para beber.

¿Puedo ayudar en algo?
Si, y una vez más, estamos muy agradecidos por la asistencia que ya nos ha brindado. Existen más fondos disponibles para hacer más pruebas y encuestas en casas que usan pozos privados. Nuestro interés es pasar la palabra a más residentes del Valle Bajo de Yakima. Por favor, si conoce a un vecino o amigo en el área que esté interesado en que se le hagan pruebas a su pozo y en hacer la encuesta, llámenos al (509) 574-2300 ó envíe un email a: PSWebContacts@co.yakima.wa.us. Como parte de nuestro esfuerzo para evaluar los niveles de nitrato en el Valle Bajo de Yakima, quizás busquemos lugares permanentes para monitoreo continuo. Por favor, si desea que consideremos su pozo para parte de este esfuerzo llámenos al (509) 574-2300.

Atentamente,

J. Rand Elliott, Presidente
Comité Asesor de Aguas Subterráneas del Valle Bajo de Yakima (GWAC)

Adjuntos

Lower Yakima Valley GWMA Program
Certified Testing Laboratories

(Updated April 29, 2015)

Laboratory Name	Address	Phone	Web Site	Approximate Cost
Ag Health Laboratories, Inc.	445 Barnard Boulevard Sunnyside, WA	(509) 836-2020	www.aghealthlabs.com	Nitrate - $36 Coliform - $24
Benton-Franklin Health District Lab	7102 West Okanogan Place Kennewick, WA	(509) 460-4206	www.bfhd.wa.gov	Nitrate - $25 Coliform - $24
Cascade Analytical Inc. - Yakima	1008 West Ahtanum Road, #2 Yakima, WA	(509) 452-7707	www.cascadeanalytical.com	Nitrate - $46 Coliform - $25
Mukang Labs, Inc.	2526 E. Saint Helens Street Pasco, WA	(509) 544-2159	www.mukanglabs.com	Nitrate - $19 Coliform - $20
Northwest Agricultural Consultants, Inc.	2545 West Falls Ave. Kennewick, WA	(509) 783-7450	www.nwag.com	Nitrate - $17.50 Coliform - NA
Valley Environmental Laboratory	15 W. Yakima Ave, Suite 210 Yakima, WA 98901	(509) 575-3999	http://www.valleylab.net/	Nitrate - $40 Coliform - $25

All of the above laboratories are certified by the Washington State Department of Ecology to test for nitrate in drinking water. Ag Health Laboratories, Benton-Franklin Health District, Cascade Analytical, Mukang Labs and Valley Environmental Laboratory are also certified to test for coliform in drinking water.

Costs shown for nitrate and coliform tests are approximate and subject to change.

Lower Yakima Valley GWMA Program
Laboratorios Certificados

Nombre del laboratorio	Dirección	Teléfono	Web Site	Costo aprox.
Ag Health Laboratories, Inc.	445 Barnard Boulevard Sunnyside, WA	(509) 836-2020	www.aghealthlabs.com	Nitratos - $36 Coliforme - $24
Benton-Franklin Health District Lab	7102 West Okanogan Place Kennewick, WA	(509) 460-4206	www.bfhd.wa.gov	Nitratos - $25 Coliforme - $24
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Valley Environmental Laboratory	15 W. Yakima Ave, Suite 210 Yakima, WA 98901	(509) 575-3999	http://www.valleylab.net/	Nitratos - $40 Coliforme - $25

Todos los laboratorios en éste documento están certificados por el Departamento de Ecología del Estado de Washington para probar nitratos en el agua potable Los laboratorios Ag Health Laboratories, Benton-Franklin Health District, Cascade Analytical, Mukang Labs, y Valley Environmental Laboratory también están certificados para probar la presencia de coliformes en el agua potable.

El costo por la prueba de nitratos y coliforme es aproximado y sujeto a cambio.

Private Well Water

Coliform Bacteria and Nitrate Information for Private Well Users

Why should my well water be tested?

Drinking contaminated water is a health risk. Some contaminants cannot be seen, smelled, or tasted. Two of the most common contaminants in drinking water are coliform bacteria and nitrate and they can be harmful.

Who should be testing my well water?

You or your landlord. Private well users are responsible for testing their own water. If you don't own your home but you use a private well, talk with your landlord about getting your water tested or seeing the most recent results. You can always take a water sample yourself and have it tested.

What should I test for and how often?

The Department of Health recommends that you test your private well water every year for coliform bacteria and nitrate.

You should also test your water when:

- You notice a change in your water, such as taste, color, or smell.*
- Your well has been flooded.
- You replace any part of your well system.
- Someone in your household is pregnant, nursing, or has an unexplained illness and you suspect your water may be at risk.
- You hear that a neighbor's water is contaminated.
- You live near industrial or agricultural activities.*

*These may require testing for something other than coliform or nitrate.

If you have had previous contamination problems or are concerned about specific contaminants, you may want to test your well water more often.

Where do I go to get my water tested?

Certified drinking water labs are located across the state. The lab you select or your local health department can help you decide what to test for, how to collect samples, and how to understand results. There is a cost for these tests. Costs this year (2010) range from $20 to $25 per test for coliform bacteria, and $30 to $42 per test for nitrate. Most labs like to provide their own sample bottles.

My nitrate level is *less than* 10 ppm, what should I do?

Nitrate levels can vary throughout the year, so if your level is 5 ppm or higher, you may want to re-sample in six months.

My nitrate level is *more than* 10 ppm, what should I do?

If your nitrate test shows levels higher than 10 parts per million, find a different and safe drinking water supply. The quickest thing to do is to begin using bottled water for drinking and food preparation. Do NOT boil water with high nitrate. Boiling water may actually increase the nitrate level, making the problem worse!

Another option is to install a device or filter designed to remove nitrate from your water. These devices are often installed on kitchen faucets, where people get their water for drinking and cooking. Nitrate is not absorbed through the skin, so it is safe to clean and bathe with it.

Other, longer term solutions include:

- Drilling a deeper well into a different groundwater source;
- Connecting to a public water system; or
- Working with others in your community to develop a new public water system to serve your home and nearby neighbors.

My test results came back with coliform in the water, what should I do?

Coliform tests usually come back as SATISFACTORY or UNSATISFACTORY. If you receive a SATISFACTORY report, it means your water was free of these bacteria at the time of the sample. Be sure to test every year for coliform bacteria.

If you receive an UNSATISFACTORY report, it may be contaminated. Do not drink the water until it tests SATISFACTORY. Find a different and safe drinking water supply. The quickest thing to do is either begin using bottled water or boil all water for drinking and food preparation. This also includes water used for making ice or coffee, brushing teeth, and washing fruits and vegetables you eat raw. Boiling water rapidly for one minute usually kills bacteria.

Your lab and local health department can help you determine if you should resample, disinfect your well, or take other action based on your results.

What are coliform bacteria and why should I care?

Coliform bacteria are organisms that are present in the environment and in the feces of humans and animals. Coliform bacteria will not likely cause illness, but their presence in drinking water indicates disease-causing organisms may also be present.

What is nitrate?

Nitrogen is a chemical found in most fertilizers, animal manure, and in septic tanks. Natural bacteria in the soil can change nitrogen into nitrate. Rain water and irrigation water can carry nitrate down through the soil into the groundwater.

What can nitrate do to me?

Too much nitrate in your body makes it harder for red blood cells to carry oxygen. While many people do not notice a difference, this can be very dangerous for infants and pregnant women. Infants exposed to high amounts of nitrate may develop "blue –baby syndrome," a condition that is rare but can be fatal.

What are the symptoms of blue-baby syndrome?

Symptoms can be confused with other illnesses. An infant with mild to moderate blue-baby syndrome may have diarrhea, vomiting, and be lethargic.

In more serious cases, the infant may have:

- skin that becomes gray, darker brown, or blue, or
- lips, finger or toe nails with a blue-like color, or
- trouble breathing.

My test results came back with *both* coliform and nitrate, what should I do?

Find a different and safe drinking water supply. The quickest thing to do is to begin using bottled water for drinking and food preparation. Boiling water kills coliform bacteria, but does not remove nitrate. Do NOT boil water with both coliform and nitrate. It may increase the nitrate level, making the problem worse! See other options under nitrate and coliform above.

My test results came back OK, but I don't like the taste/smell/ appearance of my water. What is wrong with it?

Some contaminants make water smell, taste, or look bad but are not harmful to your health. Your lab and local health department can help you determine if you need to test or treat your water.

What about Home Water Treatment Units? I've heard that these can help.

Point of use (POU) filter systems treat water at a single tap. Point of entry (POE) filter systems treat water used throughout the house.

Three types of systems that can remove nitrate from your water are:

- Reverse Osmosis Unit
- Distillation Unit
- Anion Exchange Unit

Important: All POU and POE filter systems or treatment units need maintenance to operate effectively. If they are not maintained properly, contaminants may accumulate in the units and make your water worse. In addition, some vendors may make claims about their effectiveness that are not based on science. The EPA does not test or certify treatment units, but two organizations that do are NSF International and Underwriters Laboratory.

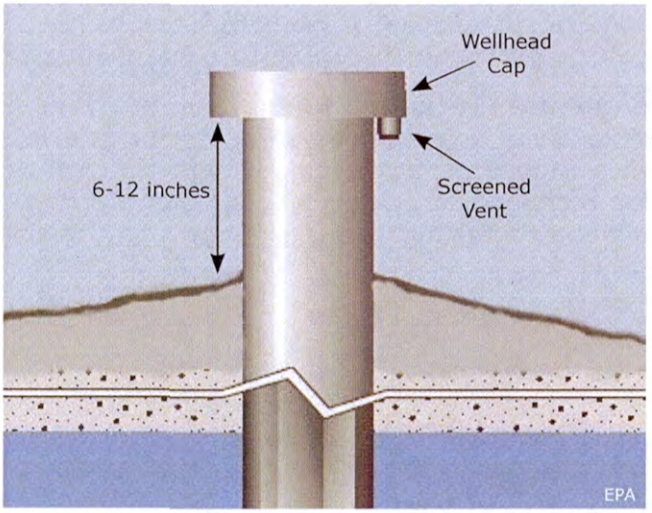
How can I protect my well water from contamination?

Make sure your wellhead extends 6 to 12 inches above the surface of the ground and is capped to keep contaminants out. Seal the ground around the wellhead and slope it away so water does not collect and seep into the well.

It is important to keep your well safe from potential contaminants that may be around your home. The further away from contamination sources, the better.

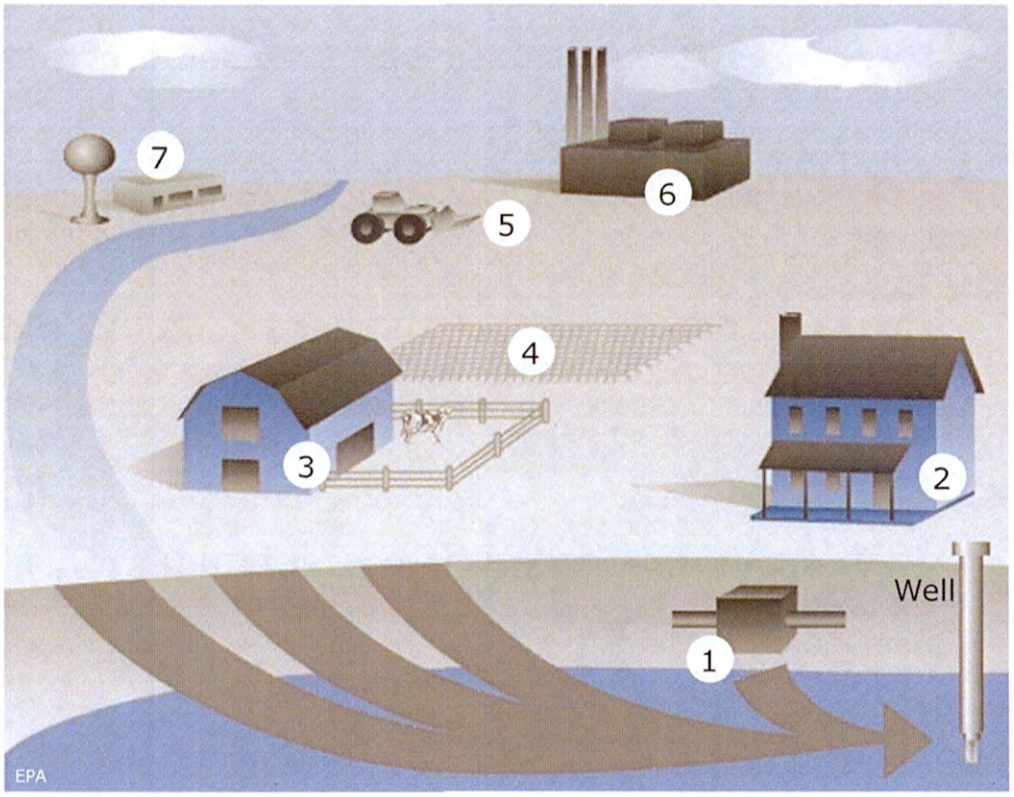
Experts suggest your well should be at least:

- 50 feet from a septic tank,
- 100 feet from the edge of a drainfield, fuel tank, barn, and any storage shed for fertilizers and pesticides, and
- 250 feet from a manure stack.



Potential Well Contaminants

1. Septic Tank
2. Household Wastes
3. Livestock Wastes
4. Pesticides and Fertilizers
5. Landfills
6. Local Industries
7. Underground Storage Tanks



Additional Resources

Local Health Departments
www.doh.wa.gov/LHJMap/LHJMap.htm

Certified Labs in Your Area
www.ecy.wa.gov/apps/eap/acclabs/labquery.asp

Certifying Organizations for Home Water Treatment Units
NSF International (Formerly National Sanitation Foundation), www.nsf.org
Underwriters Laboratory, www.ul.com

Center for Disease Control and Prevention Publications
Private Wells, www.cdc.gov/healthywater/drinking/private/wells/location.html
Emergency disinfection of wells, http://emergency.cdc.gov/disasters/wellsdisinfect.asp

Environmental Protection Agency Publications
Household wells, www.epa.gov/safewater/privatewells/pdfs/household_wells.pdf
Secondary Standards, www.epa.gov/safewater/consumer/2ndstandards.html
Filtration Facts booklet, www.epa.gov/safewater/faq/pdfs/fs_healthseries_filtration.pdf
Source Water Protection, http://cfpub.epa.gov/safewater/sourcewater

Washington State Department of Health
DOH 333-171 May 2010

For persons with disabilities, this document is available in other formats. To make a request, call 1-800-525-0127 or 1-800-833-6388 (TTY/TDD).

Agua de Pozos Privados

Información sobre las bacterias coliformes y el nitrato para usuarios de pozos privados

¿Por qué debería hacer un análisis del agua de mi pozo?

Beber agua contaminada es un riesgo para la salud. Algunos contaminantes no se pueden ver, oler ni notar por el sabor. Dos de los contaminantes más comunes del agua potable son las bacterias coliformes y el nitrato, los cuales pueden ser nocivos.

¿Quién debería analizar el agua de mi pozo?

Usted o su arrendador. Los usuarios de pozos privados son responsables de analizar su propia agua. Si usted no es propietario de su vivienda pero utiliza un pozo privado, hable con su arrendador para analizar el agua o ver los resultados más recientes. Siempre podrá tomar una muestra de agua usted mismo y hacerla analizar.

¿Qué debería buscar en el análisis y con qué frecuencia?

El Departamento de Salud recomienda que analice el agua de pozo privado todos los años para verificar que no existan bacterias coliformes y nitrato.

También deberá analizar el agua cuando:

- Note un cambio en el agua, tal como el sabor, color y olor.*
- El pozo se haya inundado.
- Reemplace cualquier parte de su sistema de pozo.
- Alguna mujer de su hogar esté embarazada, amamantando o tenga una enfermedad inexplicable y usted sospeche de que el agua puede estar en riesgo.
- Escuche que el agua de su vecino está contaminada.
- Viva cerca de zonas industriales o agrícolas.*

*Estos casos pueden requerir un análisis para evitar la existencia de otros elementos distintos de las coliformes o el nitrato.

Si ha tenido problemas de contaminación previos o está preocupado por contaminantes específicos, usted debería analizar el agua del pozo con mayor frecuencia.

¿Dónde me dirijo para analizar el agua?

Los laboratorios de análisis de agua potable certificados se encuentran en todo el estado. El laboratorio que seleccione o el departamento de salud local podrán ayudarlo a decidir qué buscar en el análisis, cómo tomar las muestras y cómo interpretar los resultados. Estos análisis tienen un costo. Los costos de este año (2010) van desde los $20 a los $25 por análisis de bacterias coliformes, y desde los $30 a los $42 para el análisis de nitrato. La mayoría de los laboratorios prefieren proporcionar sus propios recipientes para muestra.

El nivel del nitrato es *menor de* 10 ppm, ¿qué debo hacer?

Los niveles de nitrato pueden variar a lo largo del año, por lo tanto si el nivel es de 5 ppm o mayor, deberá volver a tomar una prueba dentro de seis meses.

El nivel de nitrato es *mayor de* 10 ppm, ¿qué debo hacer?

Si su análisis de nitrato muestra niveles mayores a 10 partes por millón, busque un suministro de agua potable diferente y más seguro. Lo primero que debe hacer es comenzar a utilizar agua embotellada para beber y cocinar. No hierva agua con altos niveles de nitrato. Hervir el agua puede incrementar el nivel de nitrato, ¡empeorando el problema!

Otra opción es instalar un dispositivo o filtro diseñado para eliminar el nitrato del agua. Estos dispositivos se instalan con frecuencia en los grifos de la cocina, donde las personas toman agua para beber y cocinar. El nitrato no se absorbe a través de la piel, por lo tanto es seguro utilizar esta agua para limpiar y bañarse.

Otras soluciones a largo plazo incluyen:

- Cavar un pozo más profundo en una fuente diferente de aguas subterráneas;
- Conectarse a un sistema de agua público; o
- Trabajar con otras personas de su comunidad para desarrollar un nuevo sistema público de agua para su hogar y los vecinos de la zona.

Los resultados de mi análisis indican coliformes en el agua, ¿qué debo hacer?

Los análisis de coliformes por lo general indican SATISFACTORIO o NO SATISFACTORIO. Si recibe un informe SATISFACTORIO, significa que su agua no contiene estas bacterias al momento de tomar la muestra. Asegúrese de realizar este análisis de coliformes todos los años.

Si recibe un informe NO SATISFACTORIO, el agua podría estar contaminada. No beba el agua hasta que el análisis sea SATISFACTORIO. Busque un suministro de agua potable distinto y seguro. Lo primero que debe hacer es comenzar a utilizar agua embotellada o hervida para beber y cocinar. Además, debe utilizarla para preparar hielo o café, lavarse los dientes y lavar frutas y verduras que come crudas. Hervir el agua durante un minuto por lo general mata las bacterias.

El laboratorio y el departamento de salud local pueden ayudarlo a determinar si debe volver a tomar una muestra, desinfectar el pozo o tomar otras medidas basadas en el resultado.

¿Qué son las bacterias coliformes y por qué debería tener cuidado?

Las bacterias coliformes son organismos que están en el medio ambiente y en las heces de humanos y animales. Las bacterias coliformes probablemente no causan enfermedades, pero su presencia en el agua potable indica que también puede haber organismos causantes de enfermedades.

¿Qué es el nitrato?

El Nitrógeno es un químico que se encuentra en la mayoría de los fertilizantes, en estiércol de animales y en los tanques sépticos. Las bacterias naturales de la tierra pueden cambiar el nitrógeno a nitrato. El agua de lluvia y el agua de riego pueden arrastrar el nitrato por debajo de la tierra hacia las aguas subterráneas.

¿Qué me puede hacer el nitrato?

El exceso de nitrato en el cuerpo dificulta el transporte de oxígeno que deben realizar los glóbulos rojos. Aunque muchas personas no noten la diferencia, esto puede ser muy peligroso para los bebés y las mujeres embarazadas. Los bebés expuestos a grandes cantidades de nitrato pueden desarrollar el "síndrome del bebé azul," una enfermedad extraña pero que puede ser fatal.

¿Cuáles son los síntomas del síndrome del bebé azul?

Los síntomas se pueden confundir con los de otras enfermedades. Un bebé con el síndrome del bebé azul leve a moderado puede tener diarrea, vómitos y estar apático.

En casos más graves el bebé puede tener:

- piel que cambia a color gris, café oscura o azul, o
- labios, dedos o las uñas de los pies de color azulado; o
- problemas para respirar.

Los resultados de mi análisis indican *tanto* coliformes *como* nitrato, ¿qué debo hacer?

Busque un suministro de agua potable distinto y seguro. Lo primero que debe hacer es comenzar a utilizar agua embotellada para beber y cocinar. Hervir el agua mata las bacterias coliformes, pero no elimina el nitrato. NO hierva agua con coliformes y nitrato. Puede incrementar el nivel de nitrato, ¡empeorando el problema! Consulte otras opciones bajo nitrato y coliformes más arriba.

Los resultados del análisis indican que está bien, pero no me gusta el sabor/olor/la apariencia del agua. ¿Qué está pasando?

Algunos contaminantes hacen que el agua no tenga buen olor, sabor o apariencia pero no son nocivos para su salud. Su laboratorio y el departamento de salud local pueden ayudarlo a determinar si necesita analizar o tratar su agua.

¿Qué son las unidades domésticas de tratamiento de agua? He escuchado que son útiles.

Los sistemas de filtro en el punto de uso (POU) tratan el agua en un sólo grifo. Los sistemas de filtro en el punto de entrada (POE) tratan el agua utilizada por toda la vivienda.

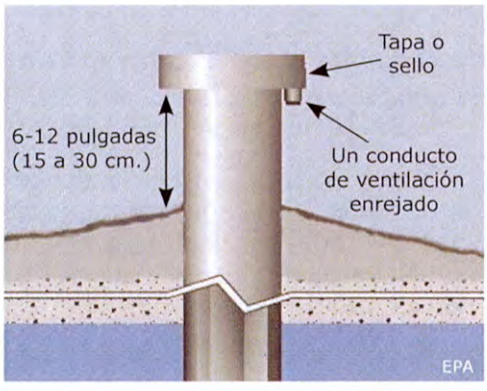
Los tres tipos de sistemas que peuden eliminar el nitrato del agua son:

- Unidad de ósmosis inversa
- Unidad de destilación
- Unidad de intercambio iónico

Importante: Todos los sistemas de filtro POU y POE o las unidades de tratamiento requieren mantenimiento para funcionar bien. Si no reciben el mantenimiento adecuado, los contaminantes se podrían acumular en las unidades y empeorar el agua. Además, algunos vendedores podrían declarar su efectividad aunque no esté basado en la ciencia. EPA no analiza ni certifica las unidades de tratamiento, pero sí lo hacen dos organizaciones: la NSF International y el Underwriters Laboratory.

¿Cómo puedo proteger el agua de mi pozo de la contaminación?

Asegúrese que la boca del pozo se extienda entre 6 a 12 pulgadas (15 a 30 cm.) por encima de la superficie del suelo y que esté tapado para que no entren los contaminantes. Selle el suelo alrededor de la boca del pozo y hágalo en declive para que el agua no se acumule y filtre dentro del pozo.



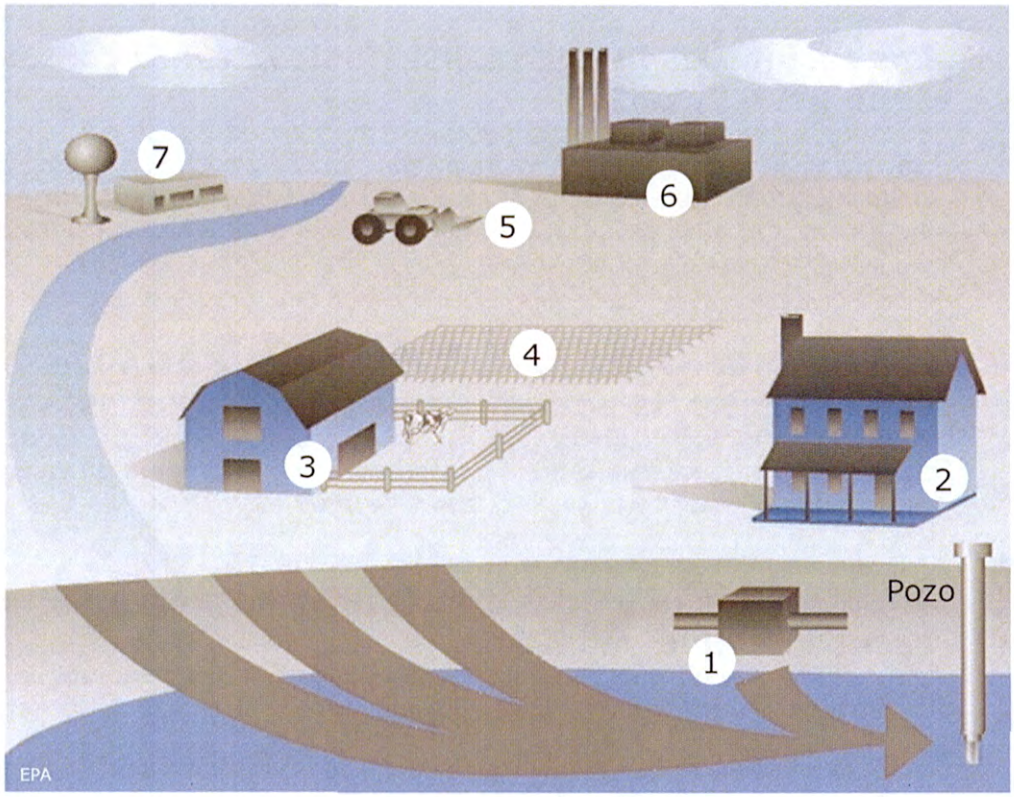
Es importante mantener el pozo protegido de contaminantes potenciales que pueden estar alrededor de su vivienda. Cuánto más lejos de las fuentes de contaminación, mucho mejor.

Los expertos sugieren que el pozo debe estar al menos:

- a 50 pies (15 metros) del tanque séptico,
- a 100 pies (30 metros) del borde de un campo de drenaje, tanque de combustible, graneros y cualquier depósito de fertilizantes y pesticidas, y
- a 250 pies (75 metros) de un montículo de estiércol.

Fuentes potenciales de contaminación del agua de pozos

1. Tanque séptico
2. Residuos domésticos
3. Residuos de animales
4. Pesticidas y fertilizantes
5. Vertedero
6. Industria local
7. Tanques de almacenamiento subterráneo



Recursos adicionales (información en inglés)

Departamentos de salud locales
www.doh.wa.gov/LHJMap/LHJMap.htm

Laboratorios certificados en su zona
www.ecy.wa.gov/apps/eap/acclabs/labquery.asp

Organizaciones certificadoras de unidades domésticas de tratamiento de agua
NSF International (Anteriormente, Fundación de Sanidad Nacional), www.nsf.org
Underwriters Laboratory, www.ul.com

Publicaciones del Centro para el Control y la Prevención de Enfermedades
Pozos privados, www.cdc.gov/healthywater/drinking/private/wells/location.html
Desinfección de emergencia de pozos, http://emergency.cdc.gov/disasters/wellsdisinfect.asp

Publicaciones de la Agencia de Protección Ambiental
Pozos domésticos, www.epa.gov/safewater/privatewells/pdfs/household_wells.pdf
Estándares secundarios, www.epa.gov/safewater/consumer/2ndstandards.html
Folleto sobre datos de filtración, www.epa.gov/safewater/faq/pdfs/fs_healthseries_filtration.pdf
Protección de fuente de agua, http://cfpub.epa.gov/safewater/sourcewater

Washington State Department of Health
DOH 333-171 mayo 2010

Para personas con discapacidades, este documento está disponible en otros formatos. Por favor llame al 1-800-525-0127 (TTY/TDD 1-800-833-6388).

Questions & Answers

Nitrate in Drinking Water

May 2012
DOH 331-214
Revised

Nitrate is a chemical found in most fertilizers, manure, and liquid waste discharged from septic tanks. Natural bacteria in soil can convert nitrogen into nitrate. Rain or irrigation water can carry nitrate down through the soil into groundwater. Your drinking water may contain nitrate if your well draws from this groundwater.

Nitrate is an acute contaminant. That means one exposure can affect a person's health.

Does the state regulate nitrate in drinking water?

Yes. State law requires public water systems to sample for many contaminants, including nitrate, on a regular basis. Our drinking water quality standard for nitrate is 10 milligrams per liter (mg/L). Public water systems with nitrate levels over 10 mg/L must notify people who receive water from them.

How does nitrate affect health?

It reduces the ability of red blood cells to carry oxygen. In most adults and children, these red blood cells rapidly return to normal. However, in infants it can take much longer for the blood cells to return to normal. Infants who drink water with high levels of nitrate (or eat foods made with nitrate-contaminated water) may develop a serious health condition due to the lack of oxygen. This condition is called methemoglobinemia or "blue baby syndrome." Some scientists think diarrhea makes this problem worse.

Low levels of nitrate in water will not have a long-lasting effect on your baby. If your baby doesn't have any of signs of blue baby syndrome, you do not need to have a doctor test for methemoglobinemia.

What are the signs of blue baby syndrome?

Moderate to serious blue baby syndrome may cause brownish-blue skin tone due to lack of oxygen. This condition may be hard to detect in infants with dark skin. For infants with dark skin, look for a bluish color inside the nose and mouth, on the lips, or fingernail and toenail beds.

Mild to moderate blue baby syndrome may cause signs similar to a cold or other infection (fussy, tired, diarrhea or vomiting). While there is a blood test to see if an infant has blue baby syndrome, doctors may not think to do this test for babies with mild to moderate symptoms.

What should I do if my infant has blue baby syndrome?

Take a baby who has brownish-blue skin tone or a bluish color to the lips, tongue, gums, nail beds, or nose to a hospital immediately. A medication called "methylene blue" will quickly return the baby's blood to normal.

Washington State Department of Health
Environmental Public Health
Office of Drinking Water

HELPING TO ENSURE SAFE AND RELIABLE DRINKING WATER

Can I prevent blue baby syndrome?

Yes. Do not give infants younger than 12 months drinking water with nitrate levels above 10 mg/L. Do not offer high-nitrate vegetables such as beets, broccoli, carrots, cauliflower, green beans, spinach, and turnips until the baby is at least seven months old.

Nitrate levels in well water can vary throughout the year. If you have a private well and you're not sure about your water quality, you may want to use bottled water to prepare your baby's food and drinks. Although boiling water kills bacteria, it will not remove chemicals such as nitrate. In fact, boiling may actually increase the nitrate level.

Will breast-feeding give my infant blue baby syndrome?

Low levels of nitrate have been found in breast milk, but the levels are not high enough to cause blue baby syndrome.

Can nitrate affect adults?

Although red blood cells quickly return to normal, some health conditions can make people more susceptible to health problems from nitrate. Individuals with the following health conditions should not drink water with more than 10 mg/L of nitrate:

- Individuals who don't have enough stomach acids.
- Individuals with an inherited lack of the enzyme that converts affected red blood cells back to normal (methemoglobin reductase).
- Women who are pregnant or trying to become pregnant. Some studies have found an increased risk of spontaneous abortion or certain birth defects.

How can I tell if my well water has nitrate?

Shallow wells, poorly sealed or poorly constructed wells, and wells that draw from shallow aquifers are at greatest risk of nitrate contamination. Manure and septic tank waste may also contain disease-causing bacteria and viruses.

If you own a private well, we recommend that you test for coliform bacteria and nitrate every year. Your county health department can tell you where you can get your water tested and may have specific recommendations for testing. Many certified labs in Washington charge $20 to $40 per test. If your nitrate test results are 5 mg/L or higher, you may want to re-sample in six months.

Where can I get more information?

If you get your water from a public water system, call your water utility or the state Department of Health at 800-521-0323. You can also visit online at http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater.aspx

If you have a private well, call your local health department. You can also find information in *Private Wells: Information for owners* (331-349) a publication available in English and Spanish at https://fortress.wa.gov/doh/eh/dw/publications/publications.cfm

For a list of certified labs, visit the state Department of Ecology online at http://www.ecy.wa.gov/apps/eap/acclabs/labquery.aspUnder "Location," select your state, city, and county. Scroll down and click on "Show results." Click on the name of a lab to see the tests it performs. Call the lab to make sure it's accredited to analyze for nitrate in drinking water.

PUBLIC HEALTH
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HEALTHIER WASHINGTON

If you need this publication in an alternate format, call 800-525-0127. For TTY/TDD, call 800-833-6388.

Julio 2013
DOH 331-214s
Revisado

Preguntas y Respuestas

Nitratos en el agua potable

El nitrato es un químico que se encuentra en la mayoría de los fertilizantes, estiércol, y residuos líquidos que se liberan de los tanques sépticos. Las bacterias naturales del suelo pueden convertir nitrógeno al nitrato. La lluvia o agua de irrigación puede llevar el nitrato a través del suelo hasta las aguas subterráneas. Su agua potable puede contener nitrato si su pozo saca agua de tales aguas subterráneas.

El nitrato es un contaminante que puede ocasionar enfermedades agudas, lo que significa que una sola exposición puede afectar a la salud de alguien.

¿Cómo afecta a la salud el nitrato?

El nitrato reduce la capacidad de los glóbulos rojos para llevar oxígeno. En la mayoría de los adultos y niños, estos glóbulos rojos se normalizan rápidamente. Sin embargo, en los lactantes, los glóbulos rojos pueden demorar más tiempo para normalizarse. Los lactantes que beben agua con altos niveles de nitrato (o comen alimentos hechos con agua contaminada con nitrato) pueden desarrollar una enfermedad seria debido a la falta de oxígeno. Esta enfermedad se llama metahemoglobinemia o "síndrome del bebé azul." Algunos científicos piensan que la diarrea puede empeorar este problema.

¿Está regulado por el estado el nitrato en el agua?

Sí. La ley estatal requiere que los sistemas de agua pública hagan pruebas para muchas contaminantes incluyendo el nitrato con regularidad. Nuestra norma para calidad del agua es 10 miligramos por litro (mg/L). Los sistemas de agua pública que contienen niveles de nitrato por encima de 10 mg/L deben notificar a las personas quien recibe agua de ellos.

Los niveles bajos de nitrato en el agua no tendrán un efecto de largo plazo en su bebé. Si su bebé no tiene ningunos de los signos del síndrome del bebé azul, no es necesario que su doctor le examine por la enfermedad de metahemoglobinemia.

¿Cuáles son los signos del síndrome del bebé azul?

El síndrome del bebé azul **moderado a serio** puede causar un tono de piel café-azulado dado la falta de oxígeno. Esta condición puede ser difícil de detectar en lactantes con piel oscura. Para bebés con piel oscura, busca un color azulado dentro de la nariz y la boca, en los labios, o la piel debajo de las uñas de las manos o los pies.

El síndrome del bebé azul **suave a moderado** puede causar signos parecidos a un resfriado u otra infección (irritado, cansado, con diarrea o vómitos). Aunque existe una prueba de sangre para ver si un lactante tiene el síndrome del bebé azul, es posible que los médicos no hagan esta prueba para los bebés con síntomas suaves a moderados.

¿Qué debo hacer si mi bebé tiene el síndrome del bebé azul?

Lleve el bebé al hospital de inmediato si el tono de la piel tiene un color café-azulado o tiene un color azulado en los labios, la lengua, las encías, la piel debajo de las uñas y la nariz. Un medicamento llamado "azul de metileno" normalizará rápidamente la sangre del bebé.

Washington State Department of Health
Environmental Public Health
Office of Drinking Water

HELPING TO ENSURE SAFE AND RELIABLE DRINKING WATER

¿Puedo prevenir el síndrome del bebé azul?

Si. No dé a los bebés menores de 12 meses de edad agua potable con niveles de nitrato más alto de 10 mg/L. No les dé verduras con alto contenido en nitrato como la remolacha, brócoli, zanahorias, coliflor, ejotes o judías, espinaca, y nabos hasta que el bebé tenga más de siete meses de edad.

Los niveles de nitrato en el agua de pozo pueden variar a través del año. Si usted tiene un pozo privado y no está seguro de la calidad del agua, es posible que desee usar agua en botella para preparar la comida y bebidas de su bebé. Aunque hervir el agua elimina las bacterias, no remueve químicos como el nitrato. De hecho, hirviendo causa la evaporación del agua que puede resultar en el incremento del nivel de nitrato.

¿Puede la lactancia materna ocasionar el síndrome del bebé azul?

Se ha encontrado bajos niveles de nitrato en la leche materna, pero los niveles no son bastantes altos para causar el "síndrome del bebé azul."

¿Puede el nitrato afectar a los adultos?

Aunque las células rojas vuelven rápidamente a la normalidad, las condiciones de salud de algunas personas las hacen más susceptible a los problemas de salud por nitrato. Las personas con las siguientes condiciones de salud no deberían beber agua con más de 10 mg/L de nitrato:

- Las personas que no tienen suficientes ácidos estomacales.
- Las personas con pérdida hereditaria de la enzima que convierte los glóbulos rojos afectados en células normales (metahemoglobina reductasa).
- Las mujeres embarazadas o que están tratando de quedar embarazadas. Alto contenido de nitratos puede incrementar el riesgo de aborto espontáneo o ciertos defectos de nacimiento.

¿Cómo puedo saber si mi agua de pozo tiene nitrato?

Los pozos poco profundos, mal sellados o construidos o los pozos que extraen agua de acuíferos poco profundos tienen riesgo más alto de tener agua contaminada con nitrato. El abono (estiércol) y los desechos de un tanque séptico pueden también contener bacterias y virus que causan enfermedades.

Si usted es el dueño de un pozo privado nosotros recomendamos que analice el agua por bacterias y nitrato cada año. El departamento de salud de su condado puede decirle donde puede obtener el análisis de su agua y pudiera tener recomendaciones específicas para el análisis. Muchos laboratorios certificados cobran entre $20 a $40 por análisis. Si el resultado del análisis de nitrato es de 5 mg/L o más alto, recomendamos que vuelva a hacer otro análisis en 6 meses.

¿Dónde puedo obtener más información?

Si usted obtiene agua de un sistema público, llame a su servicio de agua o al Departamento de Salud del Estado de Washington, Oficina de Agua Potable, al número de teléfono (800) 521-0323 o visítenos en línea en: http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater.aspx

Si tiene un pozo privado, llame al departamento de salud local. También puede encontrar información en **Pozos Privados: Información para los propietarios (331-349s)** una publicación disponible en Inglés y Español https://fortress.wa.gov/doh/eh/dw/publications/publications.cfm

Para una lista de laboratorios certificados, visite en línea al Departamento de Ecología de Washington en: http://www.ecy.wa.gov/apps/eap/acclabs/labquery.asp. Bajo "Location" seleccione su estado, ciudad y condado. En la parte baja de la página haga click en "Show results." Haga click en el nombre de un laboratorio para ver qué tipo de análisis hace. Llame al laboratorio para asegurarse que esté acreditado para hacer análisis de nitrato.

Si usted necesita esta publicación en un formato diferente, llame al 800-525-0127. Para TTY/TDD, llame al 800-833-6388.

Oct. 2008
DOH 331-179
Revised

Questions & Answers

Public Health Advisory
Coliform

Why must I boil my water?

Recent testing shows that your water system is contaminated with organisms that could cause illness.

Who can be affected? Can I become ill?

Anyone who drinks contaminated water may become ill. Infants, young children, the elderly, and people with severely compromised immune systems are more at risk of illness.

Who are people with compromised immune systems?

People who are on chemotherapy, organ or bone marrow recipients, those with HIV or AIDS, malnourished children, infants, and some of the elderly have compromised or weakened immune systems. An infection from a disease-causing organism may lead to very serious health problems for these people.

Can these diseases be spread in ways other than drinking the water?

Yes. Many of these disease-causing organisms are shed in the feces of infected people. In fact, some infected people do not have any symptoms but still shed these organisms. Childcare workers, young children who attend childcare, and caregivers for people who are sick and shedding these organisms are at the greatest risk of becoming ill. Washing hands with soap and water after using the toilet and before preparing food prevents the spread of diseases to others.

What are the symptoms to watch for?
What should I do if I think I have a waterborne illness?

Disease-causing organisms in water can cause diarrhea, stomach cramps, bloating, gas, fatigue, weight loss, nausea, vomiting, and/or fever. Symptoms may appear as early as a few hours to several days after infection and may last more than two weeks. If you are ill with these symptoms, contact your health care provider.

How can I make the water safe?

Boiling is the best way to ensure water is free of illness-causing organisms. Bring the water to a rolling boil for one minute. When it cools, refrigerate the water in clean covered containers.

If you don't want to boil your water, you can disinfect the water using household bleach. Do not use bleach that contains perfume, dyes, or other additives. Use 1/8-teaspoon bleach per gallon of water, mix thoroughly, and then let stand for 60 minutes before using.

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

HELPING TO ENSURE SAFE AND RELIABLE DRINKING WATER

Can I use bottled water?

You can use purchased bottled water. If you choose to use bottled water, Department of Health recommends water that is:

- Reverse-osmosis treated.
- Distilled.
- Filtered through an "absolute" one micron or smaller filter.

Carbonated water in cans or bottles is usually filtered or heated to remove illness-causing organisms.

During a health advisory, can I use tap water for...?

Drinking	No	Coffee or tea	No
Ice cubes	No	Showers/Baths	Yes
Brushing teeth	No	Washing clothes	Yes
Baby's formula	No	Baby's bath	See below
Washing vegetables/fruits	No	Washing dishes	See below
Preparing food	No	Pet's water bowl	Contact veterinarian

Can I bathe my baby or child using tap water?

Yes, as long as they do not drink any of the water. Don't let babies suck on a washcloth, as they will be ingesting some of the water.

Can I wash dishes?

You can use your dishwasher if you use the sanitizing/heat cycle and commercial dishwashing detergent. You can hand wash dishes, rinse them in a diluted bleach solution—one teaspoon household bleach to one gallon of water—and then let dishes air dry.

What must be done to fix the problem?

Fixing the problem could be different in each situation depending on whether the problem is at the water source or in the water lines. Usually, in every case the water lines will need to be flushed and the whole system will need to be disinfected using chlorine. The water will then be tested to make sure it is free of coliform bacteria.

How long will this health advisory be in effect?

This health advisory will remain in effect until the water is tested and results show that it meets public health drinking water standards. Your water system will notify you when that occurs.

For more information:

Personal medical questions: Contact your health care provider (physician, nurse consultant, etc.)

Call your local health jurisdiction with general questions about infectious disease, communicable disease transmission, symptoms, causes and prevention of waterborne disease.

PUBLIC HEALTH
ALWAYS WORKING FOR A SAFER AND
HEALTHIER WASHINGTON

Octubre 2008
DOH PUB. #331-179s
(Actualizado)

Preguntas y Respuestas

Advertencia de Salud Pública
Coliforme

¿Por qué debo hervir el agua?

Recientemente, se han hecho análisis del sistema de agua potable que demuestran que el agua está contaminada con organismos que pueden causar enfermedades.

¿A quién le afecta? ¿Puedo enfermarme?

Cualquier persona que beba agua contaminada puede enfermarse. Los bebés, niños, ancianos y personas con sistemas inmunológicos comprometidos tienen mayor riesgo de enfermarse.

¿Quienes son las personas con sistemas inmunológicos comprometidos?

Las personas con sistemas inmunes comprometidos incluyen personas que reciben la quimioterapia, personas que reciben órganos o transplante de médula ósea, las personas con VIH o SIDA, niños desnutridos, bebés, y algunos ancianos. Si una de estas personas se infecta de un organismo que causa enfermedades, puede resultar en problemas de salud muy graves.

¿Pueden estas enfermedades propagarse por otros medios además del agua potable?

Sí. Muchos organismos que causan enfermedades se eliminan en las heces de personas infectadas. Algunas personas infectadas no tienen síntomas, pero pueden eliminar estos organismos en las heces. Los niños pequeños que van al Kinder y los trabajadores que los cuidan, o las personas que cuidan de personas enfermas que eliminan estos organismos, corren el riesgo de enfermarse. Lavarse las manos con jabón y agua después de ir al baño y antes de preparar la comida previene la propagación de enfermedades a los demás.

¿Cuáles son los síntomas? ¿Qué debo hacer si pienso que tengo una enfermedad transmitida por el agua?

Las enfermedades que los organismos en el agua pueden causar son diarrea, calambres estomacales, inflamación, gas, mucho cansancio, pérdida de peso, náusea, vómito, o fiebre. Los síntomas pueden aparecer a las pocas horas o despúes de varios días de infectarse. Pueden durar más de dos semanas. Si está enfermo con estos síntomas, contacte a un profesional de la salud.

¿Qué puedo hacer para que el agua este limpia?

Hervir el agua es la mejor forma para asegurarse que esté libre de organismos que causan enfermedades. Ponga el agua en la estufa hasta que hierva y deje hervir el agua por un minuto. Cuando se enfríe, guárdela en un recipiente limpio y cubierto en el refrigerador. Si no quiere hervir el agua, Usted puede desinfectar el agua con cloro de uso casero. No use cloro que contenga perfume, colorantes, u otros aditivos. Use 1/8 cucharadita de cloro por galón de agua; mezcle bien y deje reposar una hora antes de usar.

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

HELPING TO ENSURE SAFE AND RELIABLE DRINKING WATER

¿Puedo usar agua embotellada?

Usted puede comprar agua embotellada. Si Usted escoge agua embotellada, el Departamento de Salud recomienda que el agua sea:

- Tratada por osmosis inversa
- Destilada
- Filtrada con un filtro de un micrón "absoluto" o menor

El agua carbonatada de lata o botella ha sido filtrada o calentada para quitar organismos que causan enfermedades.

Bajo una advertencia de salud pública, ¿puedo usar el agua de la llave para...?

Beber	No
Cubos de hielo	No
Cepillar los dientes	No
Preparar el biberón	No
Lavar verduras/frutas	No
Preparar comida	No
Café o té	No
Duchas/baños	Sí
Lavar la ropa	Sí
El baño del bebé	Vea abajo
Lavar los platos	Vea abajo
El tazón de agua de las mascotas	Contacte al veterinario

¿Puedo bañar a mi bebé o niño con el agua de grifo?

Sí, mientras no beban nada del agua. No deje que los bebés chupen la toallita porque beberían algo del agua.

¿Puedo lavar los platos?

Usted puede usar el lavaplatos si utiliza el ciclo de esterilizador/calentador y detergente para lavaplatos comercial. Usted puede lavar los platos a mano, y enjuagar con una solución de agua y lejía- una cucharadita de lejía de uso casero por cada galón de agua. Despúes deje que se sequen al aire.

¿Qué hace falta para solucionar el problema?

La solución del problema es diferente en cada situación, dependiendo si el problema está en las tuberías o en la fuente principal del agua. Normalmente, en cada situación, hay que limpiar las tuberías y desinfectar el sistema entero con cloro. Entonces se analiza el agua para asegurar que esté libre de bacteria coliform.

¿Hasta cuando durará esta advertencia de salud?

Esta advertencia de salud estará en efecto hasta que el aqua sea analizada y los resultados cumplan con las normas de salud para el agua potable. Cuando esto ocurra, se notificará al público.

Para mayor información:

Preguntas médicas personales: Contacte a un profesional de salud (médico, enfermero, etc.)

Llame a la oficina de salud local en su área con preguntas generales acerca de las enfermedades infecciosas, transmisión de enfermedades, los síntomas, las causas y la prevención de enfermedades transmitidas por el agua.

Attachment C

- Amendment Number 3 to the Agreement between State of Washington Department of Ecology and Yakima County

DEPARTMENT OF
ECOLOGY
State of Washington

Public Services ( )(S

JUL 1 6 2015

Vern Gary Don Lynn
Dave Lisa Carmen

AMENDMENT NO. 3

TO

Agreement NO. C1200235

BETWEEN THE

STATE OF WASHINGTON DEPARTMENT OF ECOLOGY

AND

YAKIMA COUNTY

PROJECT TITLE: Yakima Ground Water Management Area (GWMA)

PURPOSE: To extend the term of this Agreement and revise a deliverable between the state of Washington, Department of Ecology, hereinafter referred to as "ECOLOGY," and Yakima County, hereinafter referred to as " County."

WHEREAS: Additional time is needed to accomplish the current phase of this project.

IT IS MUTUALLY AGREED the Agreement is amended as follows:

1) Subject to other provisions, the period of performance of the Agreement shall be extended from June 30, 2015 to September 30, 2015.

2) Deliverable 4.1 for the County is amended and replaced to read as follows:

4.1 Submit a complete Table of Contents for the Groundwater Management Program report which conforms to the general guidelines set forth in WAC 197-100-100, and completed draft portions of the (1) Area characterization section, (2) Problem definition section, and (3) Identification of water quality goals and objectives section.

All other terms and conditions of the original Agreement including any Amendments remain in full force and effect, except as expressly provided by this Amendment.

This Amendment is signed by persons who represent that they have the authority to execute this Amendment and bind their respective organizations to this Amendment.

State of Washington Department of Ecology
Contract no. C1200235, Amendment 3
Yakima County

This Amendment is effective upon the signature date of Ecology.

IN WITNESS WHEREOF: the parties hereto, having read this Amendment in its entirety, including all attachments, do agree in each and every particular and have thus set their hands hereunto.

State of Washington
Department of Ecology
BY

Polly Zehm 7/2/15
Signature Date

Polly Zehm

Deputy Director

BOARD OF YAKIMA COUNTY COMMISSIONERS

J. Rand Elliott, Chairman

Michael D. Leita, Commissioner

Kevin J. Bouchey, Commissioner
Constituting the Board of County Commissioners for Yakima County, Washington

Approved as to form only.
Assistant Attorney General

Linda K O'Hara

Attest: Tiera L. Girard
Clerk of the Board

Linda Kay O'Hara
Deputy Clerk of the Board

Approved ~~as to~~ form:

Deputy Prosecuting Attorney

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