



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

October 18, 2017

David Bowen
Department of Ecology, Central Region Office
1250 West Alder Street
Union Gap, WA 98903

Re: **Lower Yakima Valley GWMA - 2017 Third Quarter Report (IAA No. C 1200235)**

Dear David:

Enclosed please find one (1) copy of Yakima County's third-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 separately.

If you have any questions, please let me know.

Thank you.

Lisa H. Freund, Administrative Manager
Yakima County Public Services

enclosure

Yakima County ensures full compliance with Title VI of the Civil Rights Act of 1964 by prohibiting discrimination against any person on the basis of race, color, national origin, or sex in the provision of benefits and services resulting from its federally assisted programs and activities. For questions regarding Yakima County's Title VI Program, you may contact the Title VI Coordinator at 509-574-2300.

If this letter pertains to a meeting and you need special accommodations, please call us at 509-574-2300 by 10:00 a.m. three days prior to the meeting. For TDD users, please use the State's toll free relay service 1-800-833-6388 and ask the operator to dial 509-574-2300.

**IAA No. C 1200235 – Third Quarter 2017 Report
Lower Yakima Valley GWMA
September 30, 2017**

**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 final GWAC meeting summaries of July 13, July 27, August 10, August 24, September 7, and September 21, 2017; the Irrigated Ag Working Group (IAWG) meeting summary of August 7, 2017; and the Funding Working Group meeting summaries of July 12 and September 13, 2017. The remaining working groups—Residential, Commercial, Industrial, and Municipal (RCIM); Data Collection, Characterization and Monitoring; Regulatory Framework; Livestock/CAFO; and the Education and Public Outreach (EPO)—did not hold meetings in this 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.

GWMA Program Development. The GWAC held six meetings in the third quarter to work through the draft program alternatives section of the Program.

Alternative Land and Water Use Management Strategies for Reaching Program Goals and Objectives (WAC 173 100-100(4)). A draft alternatives section, outlining various land and water use management strategies for reaching the program's goals and objectives, was compiled and introduced to the GWAC in June. The 240-plus list reflected a compilation of recommendations by the working groups and included a separate literature review. The GWAC reviewed and discussed each alternative during the third quarter, and developed a color-coding system to reflect its decisions. Green meant that the alternative should be kept on the list for further review; yellow meant that the alternative should be consolidated with other, similar alternatives; red meant the alternative should be removed, and blue meant that the group would revisit the alternative.

At the end of the quarter, the GWAC had agreed to keep 101 of the alternatives. 83 were eliminated, and 62 were consolidated with similar proposed alternatives. A total of 14 merited further discussion in the fourth quarter. (Note: as members had suggested additional alternatives in the third quarter, the original list grew from 246 in June to 260 in September).

The original alternatives' list presented to the GWAC (List 2.1_Work Group alternatives with WG recommendations 6-22-17-Final Vern) and the GWAC's September 21 version (Copy of the GWMA Survey Report after GWAC 9.21.17) are included as Attachment [B].

The working groups, meanwhile, had either largely completed their work (Regulatory Framework, RCIM, IAWG) or were waiting for the GWAC to complete the alternatives (Data Collection, EPO) to move forward. The Funding Working Group, meanwhile began working on funding sources for the proposed alternatives that had received the green light from the GWAC in this quarter.

Other Work Plans and Products

Ambient Groundwater Monitoring Network (AMN)

The U.S. Geological Survey identified approximately 160 domestic wells evenly distributed within the GWMA that had verified well logs, known screened intervals, and permission from the owner for USGS staff to sample groundwater for nitrate concentrations. Sampling was scheduled to occur at each well six times between April and December 2017, of which four sampling rounds were completed by the end of September.

Round five was scheduled to get underway in October, and round six in late November and early December. In addition to the domestic well sampling, 24 surface drain sites were identified and were also sampled four times each by September, with the remaining two sampling events on the same schedule as the domestic well network.

Nitrate concentrations in groundwater from the first rounds of sampling averaged 6.05 mg/L, with approximately 20 percent of samples exceeding the EPA drinking water standard of 10 mg/L. At the time of this writing, no attempt had been made to analyze the spatial extent of nitrate concentrations, identify trends, correlate concentrations with recharge locations or land uses, or to compare the current data to previous nitrate concentration measurements in the basin.

Working Group Activities

Funding Working Group (Vern Redifer, Chair)

The Funding Working Group held meetings on July 12 and September 13. At its July meeting members discussed the alternatives they believe are most likely to move forward and potential funding sources. The group also discussed what the GWAC might look like in 2018.

At the September meeting the group began discussing who would carry out the proposed alternatives that had already received a green light from the GWAC, the cost of each, and possible financial sources. The South Yakima Conservation District (SYCD), Washington State University, and the Yakima Health District were discussed as potential contractors to fulfill educational campaigns (agricultural producers, urban and hobby, health risk). SYCD representative Laurie Crowe was tasked with considering potential GWAC-approved alternatives, and putting together a program, costing it out and reporting back at the next funding meeting. The group further agreed that WSDA would be asked to summarize its recommendations and estimate the cost and frequency of each action within the Nitrogen Availability Assessment (NAA).

Irrigated Ag (IAWG) (Troy Peters, Chair)

The IAWG met on August 7 to review and provide comments to WSDA representatives on the Irrigated Ag Section of the Draft Nitrogen Availability Assessment (NAA). Member comments ranged from the reliability of the sources that supplied the survey data, to the value of the benefits of nitrogen-fixing cover crops, to questions about the low-range estimate for juice grape growers and recommendations to remove the table showing the low-, medium-, and high-range estimates, to an individual's comments regarding "soil organic matter conversion to nitrate" section of the NAA. WSDA either responded directly to the comments or agreed to take them under advisement.

GWMA Website

The GWMA website continued to be updated in real time.

Contracts and Interlocal Agreements

No contracts were executed in the third quarter.

Attachment A

- Final GWAC meeting summary of July 13, 2017.
- Final GWAC meeting summary of July 27, 2017.
- Final GWAC meeting summary of August 10, 2017.
- Final GWAC meeting summary of August 24, 2017.
- Final GWAC meeting summary of September 7, 2017.
- Final GWAC meeting summary of September 21, 2017.
- GWAC agenda and public meeting notice for July 13, 2017.
- GWAC agenda and public meeting notice for July 27, 2017.
- GWAC agenda and public meeting notice for August 10, 2017.
- GWAC agenda and public meeting notice for August 24, 2017.
- GWAC agenda and public meeting notice for September 7, 2017.
- GWAC agenda and public meeting notice for September 21, 2017.
- GWAC attendance roster record for July 13 and 27, August 10 and 24, September 7 and 21, 2017.
- Irrigated Ag Working Group (IAWG) – August 7, 2017.
- Funding Working Group – July 12 and September 13, 2017.
- Residential, Commercial, Industrial and Municipal (RCIM) Working Group – there were no Working Group meetings.
- Data Collection, Characterization and Monitoring Working Group – there were no Working Group meetings.
- Regulatory Framework Working Group – there were no Working Group meetings.
- Livestock/CAFO Working Group – there were no Working Group meetings.
- Education and Public Outreach (EPO) Working Group – there were no Working Group meetings.

YAKIMA VALLEY GROUNDWATER MANAGEMENT AREA ADVISORY COMMITTEE (GWAC)

MEETING SUMMARY

Thursday, July 13, 2017 – 5:00 p.m. – 7:00 p.m.

Yakima County Road Maintenance Conference Room
1216 South 18th Street
Yakima, WA 98901

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: This meeting was called to order at 5:02 PM by Vern Redifer, 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)	✓	
Ron Cowin	Roza-Sunnyside Joint Board of Control	✓	
	Roza-Sunnyside Joint Board of Control (alternate)		

Laurie Crowe	South Yakima Conservation District	✓	
Ron Heit	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)	✓	
Dave Cole	Yakima Health District		✓
Ryan Ibach	Yakima Health District (alternate)		✓
Dr. Troy Peters	WSU Irrigated Agriculture Research and Extension Center		✓
Lucy Edmondson	U.S. Environmental Protection Agency	✓	
Nick Peak	U.S. Environmental Protection Agency (alternate)		✓
Elizabeth Sanchey	Yakama Nation		✓
Stuart Crane	Yakama Nation (alternate)	✓	
Virginia "Ginny" Prest	WA Department of Agriculture		✓
Gary Bahr	WA Department of Agriculture (alternate)	✓	
Andy Cervantes	WA Department of Health	✓	
Sheryl Howe	WA Department of Health (alternate)		✓
David Bowen	WA Department of Ecology	✓	
Sage Park	WA Department of Ecology (alternate)		✓
Lino Guerra	Hispanic Community Representative		✓
Rick Perez	Hispanic Community Representative (alternate)		✓
Jessica Black	Heritage University		✓
Matt Bachmann	USGS	✓	

14 **II. Welcome, Meeting Overview and Introductions:** Vern announced that GWAC member
15 Dave Cole (Yakima Health District) tragically died in a motorcycle accident the night before.
16 He asked that members remember Dave's family in their thoughts and prayers. Everyone
17 then introduced themselves. Vern reviewed the agenda – there were no additions. The
18 group paused for a moment of silence.

19
20 **III. Working Group Reports:** The Funding Working Group was the only group that had met
21 since the last GWAC meeting and therefore it was the only one to report.
22 **Funding:** Vern stated that the group had met the previous evening. They had good
23 discussions about the alternatives they felt were most likely to move forward and potential
24 funding sources. The group also discussed what the GWAC might look like in 2018.

IV. Review and Discuss Results of Survey Monkey on Alternative Land and Water Use

Management Strategies for Reaching Program Goals and Objectives per WAC 173-100-

100(4): After discussions how to proceed through the results of the survey, the group decided to look at those items with the most “yes” votes first. As discussions ensued the group developed a color-coding system. Green meant the alternative should be kept on the list for further review; green and the word “consolidate” meant that the alternative should be consolidated with other similar alternatives that were suggested elsewhere; red meant the alternative should be removed and blue meant that the group was going to “revisit” the alternative. Vern said of the 246 alternatives there was unanimity on three. 14 of the 22 members had voted but there were no names disclosed on the votes.

The group agreed to keep these alternatives on the list for further review

No. 66: Encourage commodity groups to provide education on water management and fertilizer use through regular meetings.

No. 79: Implement Ambient Groundwater Monitoring Plan.

No. 80: Implement Drinking Water Quality Monitoring Plan.

No. 159: Encourage the WSDA and Conservation Districts to continue education and outreach to livestock operators about impacts and practices related to compliance with relevant State and federal requirements for groundwater protection, particularly addressing those not currently acting in good faith toward that objective. *The group agreed to delete the word “livestock” found in the first sentence and the phrase at the end of the alternative “. . . particularly addressing those not currently acting in good faith toward that objective.”*

No. 10: Identify or create an organization (Lead Entity) responsible for implementation and oversight of the LYV GWMA Groundwater Management Plan and acquisition of stable funding to support their activities. Potential entities include Yakima County, South Yakima Conservation District (SYCD), Yakima County Health District, Washington State Department of Agriculture (WSDA), Ecology, and/or a yet to be formed entity. *The group agreed to delete the sentence: “Potential entities include Yakima County, South Yakima Conservation District (SYCD), Yakima County Health District, Washington State Department of Agriculture (WSDA), Ecology, and/or a yet to be formed entity.”*

No. 154: Inform farmers of those BMPs prioritized by Livestock/CAFO and Irrigated Agriculture Work Groups from HDR list to reflect greatest effectiveness in nitrate reduction. *The group agreed to delete the words “from HDR” since the Livestock/CAFO Working Group did not come to a consensus on the HDR list. Jim Davenport said that the HDR list had not*

Groundwater Management Area (GWMA):

The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards

61 *been reviewed by the Irrigated Ag Working Group. Another member thought Jim Trull*
62 *(former chair of the group until his passing) had worked on that list before Jim Davenport*
63 *began. Yakima County Support Staff will check into it.*

64 **No. 195:** Encourage advanced irrigation management. Recognizing that there is significant
65 cost involved in changing an irrigation system, look for strategic opportunities in the area
66 where the use of more advanced irrigation management systems could have the greatest
67 benefit for reducing nitrogen impacts to groundwater. One example of advanced irrigation
68 management is electronic sensor irrigation water management (IWM). Identify federal,
69 state and local incentive programs, such as grants, and low interest loans, to facilitate a
70 transition to more advanced irrigation management in those areas. *The group agreed to*
71 *add the words "EQIP-like" at the end of the alternative.*

72 **No. 29:** Maintain the County's GWMA website.

73 **No. 23:** Provide Yakima County fiscal support to maintain its GIS data base on the GWMA
74 over time. *The group agreed it was premature to say "Provide Yakima County fiscal support*
75 *to maintain its GIS data base" The sentence was rewritten as follows: "Maintain a GIS*
76 *data base on the GWMA over time."*

77 **No. 223:** Use effective application schedules, placement, rate and time of application and
78 speed of release for specific crop requirements.

79 **No. 75:** Inform the public about the health risks related to nitrates in drinking water. *Andy*
80 *Cervantes, Department of Health, stated that they were already doing this and*
81 *recommended the words "Have DOH continue to" be added to the beginning of the first*
82 *sentence. The group agreed.*

83 **No. 11:** Implement an Adaptive Management Plan utilizing data collected, progress made,
84 or lack of progress to inform the community on adjustments that need to be implemented.
85 Plan could incorporate availability of technology, education and outreach, tracking exports,
86 land use regulations, treatment systems, and other charges to inform decision makers
87 regarding management changes necessary for a successful program.

88 **No. 165:** Support and advocate private, public, and industry investment in technology,
89 including at research institutions, specific to addressing nitrate contamination in
90 groundwater, especially where it creates improvements for the public good.

91 **No. 18:** Further develop a local forum for disseminating information and facilitating
92 technical exchange regarding BMPs for livestock management and groundwater protection.
93 Endorse and distribute materials by all effective means that will educate the public about
94 the facts of livestock waste management and the science of groundwater protection. *The*
95 *group agreed to add the words "include all fertilizer types."*
96

The group agreed to keep these on the list and consolidate them with similar alternatives

No. 228: Inform farmers that fertilization and supplemental irrigation beyond the optimum rate will not necessarily produce better yields or higher profits without serious side effects.

No. 68: Educate irrigation users on the consequences of too much irrigation.

No. 74: Encourage commodity groups to provide education on water management and fertilizer use through regular meetings.

No. 81: Establish a fund and plan to analyze data collected in ambient water quality monitoring and drinking water well monitoring programs. Study short-term seasonal variations in nitrate concentrations over next year or two – addresses how changes in nutrient application over the agricultural cycle affects things. Study long-term trends that develop over several years – to track whether the overall picture is getting better, whether changes recommended by the GWMA are having impact.

No. 128: Establish or maintain ongoing, extended funding necessary for the Yakima County Department of Public Services and Yakima Health District to actively participate in water quality improvement, testing, monitoring, scientific data analysis, and infrastructure development.

No. 161: Create and maintain a central depository of public information online, as part of an Education and Outreach Program (EOP) informing producers of the nitrate issue, community impacts, and Best Management Practices (BMPs).

No. 49: Broaden the pool of people GWMA is educating or communicating with.

No. 50: Maintain a public education program regarding nitrate pollution and health risk over a 5-10 year period. Provide all materials distributed to the public in English and Spanish.

No. 69: Inform farmers about technological improvements in irrigation that permit easier management of water, descriptions of specific improved technology, and economic viability of technological advancements.

No. 142: Request the county include the EPO flyer on OSS maintenance in correspondence with GWMA homeowners for 5 years, i.e., tax bills, property transfers.

The group agreed this alternative should be removed from the list

No. 222: Avoid fertilizer material and manure spills during transport, storage, and application.

The group agreed to revisit this alternative at a later date

No. 94: Review and evaluate the WSDA Dairy Nutrient Management Program inspection protocols to assist in determining if additional resources should be allocated and identify any areas for improvement of the inspections themselves. *The group agreed to add quote marks around the word "protocols."*

No. 1: Pump, treat and reinject groundwater.

A member asked if the survey results the group had reviewed could be sent electronically to members so they would have a chance to review it in better detail before the next meeting. She also asked if alternatives could be added to the list. Vern directed the group to send any additions to Yakima County Support Staff. They would be added to the list and sent out with the rest. Another member was concerned how long the review would take and suggested the group should extend their meeting times; Vern believed the process would move along more quickly now that the group had developed a process.

V. Committee Business: The June 29, 2017 meeting summary was approved with one change.

VI. Public Comment: There were no public comments. The meeting adjourned at 6:55 PM.

VII. Next Meeting: Thursday, July 27, 2017, Radio KDNA Conference Rooms 1-2, 121 Sunnyside Avenue, Granger.

VIII. Next Steps: 1) Yakima County Support Staff will check to see if they can find Jim Trull's work on a BMP list. 2) Vern directed members to send any additional alternatives to Yakima County Support Staff in the next few days. They would be added to the current list review list and sent out next week.

IX. Meeting Summary approved by the GWAC on July 27, 2017.

YAKIMA VALLEY GROUNDWATER MANAGEMENT AREA ADVISORY COMMITTEE (GWAC)

MEETING SUMMARY

Thursday, July 27, 2017 – 5:00 p.m. – 7:00 p.m.

Radio KDNA Conference Rooms 1-2
121 Sunnyside Avenue, Granger, WA 98932

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:** This meeting was called to order at 5:01 PM by Vern Redifer, 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)	✓	
Ron Cowin	Roza-Sunnyside Joint Board of Control		✓
	Roza-Sunnyside Joint Board of Control (alternate)		
Laurie Crowe	South Yakima Conservation District	✓	

Rodney Heit	South Yakima Conservation District (Alternate)		✓
John Van Wingerden, III	Port of Sunnyside	✓	
Jay Decker	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		✓
Lucy Edmondson	U.S. Environmental Protection Agency		✓
Nick Peak	U.S. Environmental Protection Agency (alternate)		✓
Elizabeth Sanchey	Yakama Nation		✓
Stuart Crane	Yakama Nation (alternate)		✓
Virginia "Ginny" Prest	WA Department of Agriculture	✓	
Gary Bahr	WA Department of Agriculture (alternate)		✓
Andy Cervantes	WA Department of Health	✓	
Sheryl Howe	WA Department of Health (alternate)		✓
David Bowen	WA Department of Ecology	✓	
Sage Park	WA Department of Ecology (alternate)		✓
Lino Guerra	Hispanic Community Representative		✓
Rick Perez	Hispanic Community Representative (alternate)		✓
Jessica Black	Heritage University		✓
Matt Bachmann	USGS		✓

13 **II. Welcome, Meeting Overview and Introductions:** Vern welcomed everyone and reviewed
 14 the agenda – there were no additions. Everyone present introduced themselves. The
 15 group paused for a moment of silence in preparation for the meeting.

16
 17 **III. Continued Review and Discussion of Results of Survey Monkey on Alternative Land and**
 18 **Water Use Management Strategies for Reaching Program Goals and Objectives per WAC**
 19 **173-100-100(4):** Vern indicated that he had organized the alternatives into categories
 20 grouping similar alternatives together to help expedite the review. He had also received
 21 additional alternatives from members which he included in the spreadsheet. These are
 22 marked as *NEW* in the summary. Vern reminded everyone of the color coding system the
 23 group had devised at its last meeting: green meant keep the alternative; red meant delete,
 24 and blue meant additional discussion was required. Later on the group added yellow which
 25 meant keep the alternative but consolidate it with others. A member had compiled a list of

questions that would be important to ask once the group began discussing which alternatives to ultimately keep. The questions were as follows: 1) who will implement it; 2) who's the target; 3) is someone already doing this; 4) is there sufficient funding; and 5) is it economically viable?

The group agreed to keep these alternatives on the list for further review. (Green)

No. 158: Recommend that dairies and CAFOs use those Best Management Practices contained within Attachment B to the Livestock/CAFO Work Group's Report to the GWAC.

No. 155: Determine who implements the BMP and who monitors it and the time frame in which to measure/monitor it – problem with available expertise, timing, installation cost.

No. 170: Install liners in liquid waste storage lagoons.

No. 174: Improve composting regulations.

No. 139: Request that the Department of Ecology develop a plan for finding and decommissioning abandoned wells in the next 12 months, using the LYVGWMA as a pilot project. *The group agreed to add "revise as needed" to this alternative.*

No. 137: *The group agreed to split this alternative into two as follows: #1 Educate the public regarding the importance of the integrity of wells, particularly those without a well log; and, #2 fund and encourage well inspections by the Yakima Health District or professional well engineers.*

No. 140: Permit the repair or decommissioning of wells by general contractors, rather than exclusively by well-drillers, so as to diminish costs of decommissioning.

No. 248: NEW: Require WSDA to establish a monitoring system for compliance with NRCS Standard 317 Composting Facility on Washington dairies and to penalize operations that do not comply with this standard. *The group added: "For new compost facilities, phase in for existing."*

No. 254: NEW: Encourage prompt incorporation of manures and fertilizers after application to cropland. *The group added "where appropriate" to the end of this sentence.*

No. 255: NEW: Discourage broadcast application of manures to cropland.

No. 256: NEW: Encourage application of manures and fertilizers by surface banding.

No. 17: Cooperate with the WCC and WSDA in their efforts to document regulatory compliance for dairies within the GWMA that are completing and implementing Dairy Nutrient Management Plans (DNMP). Explore the possibility of disclosing non-proprietary data produced through the DNMP process.

No. 166: Require more complete disclosure of Dairy Nutrient Management Plans. *The group agreed to remove the first word "require" and insert the word "seek" in its place.*

No. 19: Quantify the nutrient value and rate of release of nitrate from livestock waste under various Lower Yakima Valley conditions to become part of the nutrient management guidelines.

No. 182: Amend Dairy Nutrient Management Act to extend WSDA's authority to land application acreage (off dairies) with which dairy facilities contract pursuant to nutrient management plans. *Delete words: "with which dairy facilities contract pursuant to nutrient management plans." Add words: "Ginny wants other nutrient sources too."*

No. 248: NEW: WSDA/DNMP will complete Technical No. 23 inspections on all Waste Storage Ponds (lagoons) in the GWMA boundaries.

No. 218: Distribute information to farmers on what can happen with applied manure, what should be applied and reasonable, agronomic rates of application. *The group agreed to change the word "manure" to "nitrogen."*

No. 171: Install impervious surfaces beneath silage/feed storage. *Delete the word "feed" and add the word "recommend" at the end of the sentence.*

The group agreed to keep these on the list and consolidate them with similar alternatives.

(Yellow)

No. 116: Search for abandoned wells.

No. 60: Offer incentives for property owners to identify and properly abandon wells.

No. 118: Compare Google Earth to Yakima County GIS images to determine building changes and thus possible well usage changes. Focus first on hotspot high density areas in GWMA. Ground truth suspected problem wells.

No. 121: Provide some form of protection for self-reporting of abandoned or improperly decommissioned wells.

No. 115: Provide grant funding for well decommissioning.

No. 119: Educate realtors and banking industry about disclosure of abandoned wells in property transfers.

No. 120: Educate public regarding liability of an ill-secured well.

No. 252: NEW: Require WSDA to establish an air monitoring system for compliance with NRCS Standard 590 Nutrient Management and NRCS Standard 317 Composting Facility on Washington dairy farms and to penalize operations that do not comply with these standards. *The group agreed to add this one to Alternative No. 251.*

No. 231: Require soil sampling results and area fertilized from exported dairy manure as a precondition of exportation of dairy nutrients off dairy properties. *The group added the note: "See No. 182."*

No. 229: Develop an approach for data collection of volume and location of manure application off dairy sites. *The group added the note: "See No. 182."*

The group agreed these alternatives should be removed from the list. (Red)

No. 156: Identify and publish a list of poor management practices. Recommend that they be terminated or avoided.

No. 181: Create a state CAFO Siting Team, composed of representatives of relevant state agencies with support from USGS, to which the county commission could refer proposed CAFO sitings or expansions. The CAFO Siting Team would provide a recommended site suitability determination, based upon a predetermined scoring system, including description of environmental risk factors and mitigation strategies.

No. 176: Remove wastes from barnyards and other areas of animal concentrations and frequently convey them to waste storage or treatment facilities.

No. 178: Entrain water (as rain or snow-melt) collected from roofs away from animal pen or manure collection facilities.

No. 179: Drain low areas where ponds accumulate to collect and manage waste waters.

No. 173: Compost more manure.

No. 59: Advise the public that GWMA is looking for abandoned wells. Wellhead protection education.

No. 73: Advise the public that GWMA is looking for abandoned wells.

No. 117: Send a postcard to 10 percent of known property owners on record having a well asking about knowledge of older wells.

No. 138: Require that site inspections for possible abandoned wells be performed before building permits are issued for properties that are proposed to be redeveloped after prior development of domestic, agricultural or industrial uses.

No. 204: Identify and decommission abandoned agricultural irrigation wells.

No. 123: Amend RCW 18.104.055 to dedicate a portion of a notice of intent fees to a fund to be used by Ecology (or Health) for the proper decommissioning of wells in those cases where DOE (or Health) determines that such publicly-funded action is necessary in the public interest to protect or enhance the quality of public health (infirmity of the public health).

- No. 122:** Seek legislative change on requirements for well decommissioning, make them cheaper.
- No. 253:** Establish a plan for monitoring emissions of reactive nitrogen to the atmosphere in the GWMA target area. Combine this with modes such as the USGS SPARROW model and the National Atmospheric Deposition Program's Ammonia Monitoring Network to provide ongoing measurement of nitrogen volatilization.
- No. 95:** Add staff to WSDA to oversee Dairy Nutrient Management Plans and complaints regarding manure spills.
- No. 101:** Charge dairies for Conservation District preparation of Dairy Nutrient Management Plans.

The group agreed to revisit these alternatives at a later date. (Blue)

- No. 249:** NEW: Enforce RCW 70.95.020, RCW 70.95.100, RCW 70.95.160, RCW 70.95.165, RCW 70.95.179, RCW 70.95.180, RCW 70.95.185, RCW 70.95.200, RCW 70.95.205, RCW 70.95.240, RCW 70.95.280, RCW 70.95.285, RCW 70.95.290, RCW 70.95.300, RCW 70.95.305, RCW 70.95.306, RCW 70.95.310, and RCW 70.95.315 (Note - RCW Chapter 70.95 is titled "Solid Waste Management - Reduction and Recycling")
- No. 250:** NEW: Enforce WAC 173-350-010, WAC 173-350-040, WAC 173-350-200, WAC 173-350-220, WAC 173-350-225, WAC 173-350-230, WAC 173-350-320, WAC 173-350-330, WAC 173-350-500, WAC 173-350-700, WAC 173-350-710, and WAC 173-350-715. (Note - WAC Chapter 173-350 is titled "Solid Waste Handling Standards")
- No. 251:** NEW: Require WSDA to establish air monitoring system for compliance with NRCS Standard 370 Atmospheric Resource Quality Management on Washington farms and to educate operations that do not comply with this standard.
- No. 257:** NEW: Enforce RCW 70.94.011, 70.94.040, RCW 70.94.141, RCW 70.94.151, RCW 70.94.152, RCW 70.94.153, RCW 70.94.154, RCW 70.94.161, RCW 70.94.181, RCW 70.94.331, RCW 70.94.380 (Note - RCW Chapter 70.94 is titled "Washington Clean Air Act").
- No. 258:** NEW: Enforce WAC 173-442-030, WAC 173-442-040, WAC 173-442-050, WAC 173-442-060, WAC 173-442-070, WAC 173-442-160, WAC 173-442-170, WAC 173-442-200, WAC 173-442-210, and WAC 173-442-220 (Note - WAC Chapter 173-442 is titled "Clean Air Rule")
- No. 93:** Summarize the DNMP reporting and provide information that would disclose the amount of manure the CAFO's in the GWMA created and where it was distributed.
- No. 94:** Review and evaluate the WSDA Dairy Nutrient Management Program inspection "protocols" to assist in determining if additional resources should be allocated and identify

167 any areas for improvement of the inspections themselves. *The group agreed to keep this in*
168 *the blue category (it had been discussed at the last meeting).*

169

170 **IV. Committee Business:** The July 13, 2017 meeting summary was approved as presented.

171

172 **V. Public Comment:** There were no public comments. The meeting adjourned at 7:00 PM.

173

174 **VI. Next Meeting:** August 10, 2017, Yakima County Road Maintenance Conference Room, 1216
175 South 18th Street, Yakima.

176

177 **VII. Next Steps:** The group will be encouraged to look at the RCWs and WACs contained in
178 Alternative Nos. 249, 250, 257 and 258 prior to discussion at the group's next meeting.

179

180 **VIII. Meeting Summary** approved by the GWAC on September 21, 2017.

YAKIMA VALLEY GROUNDWATER MANAGEMENT AREA ADVISORY COMMITTEE (GWAC)

MEETING SUMMARY

Thursday, August 10, 2017 – 5:00 p.m. – 7:00 p.m.

Yakima County Road Maintenance Conference Room
1216 South 18th Street, Yakima, WA 98901

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:** This meeting was called to order at 5:04 PM by Vern Redifer, 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)	✓	
Ron Cowin	Roza-Sunnyside Joint Board of Control	✓	
	Roza-Sunnyside Joint Board of Control (alternate)		
Laurie Crowe	South Yakima Conservation District	✓	

Rodney Heit	South Yakima Conservation District (alternate)		✓
John Van Wingerden, III	Port of Sunnyside	✓	
Jay Decker	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		✓
Lucy Edmondson	U.S. Environmental Protection Agency	✓	
Nick Peak	U.S. Environmental Protection Agency (alternate)		✓
Elizabeth Sanchey	Yakama Nation		✓
Stuart Crane	Yakama Nation (alternate)	✓	
Virginia "Ginny" Prest	WA Department of Agriculture	✓	
Gary Bahr	WA Department of Agriculture (alternate)		✓
Andy Cervantes	WA Department of Health	✓	
Sheryl Howe	WA Department of Health (alternate)		✓
David Bowen	WA Department of Ecology	✓	
Sage Park	WA Department of Ecology (alternate)		✓
Lino Guerra	Hispanic Community Representative		✓
Rick Perez	Hispanic Community Representative (alternate)		✓
Jessica Black	Heritage University		✓
Matt Bachmann	USGS	✓	

13 **II. Welcome, Meeting Overview and Introductions:** Introductions were made and Vern
 14 reviewed the agenda. A member asked to add an item to the agenda – a concern she had
 15 that several GWAC members were speaking on behalf of the GWMA purportedly spreading
 16 misinformation. The group agreed to address this at the end of the meeting. The group
 17 then paused for a moment of silence.

18
 19 **III. Continued Review and Discussion of Results of Survey Monkey on Alternative Land and**
 20 **Water Use Management Strategies for Reaching Program Goals and Objectives per WAC**
 21 **173-100-100(4):** Vern reminded everyone of the color-coding system they had developed.
 22 He also advised that he had resorted the list again to move educational alternatives into a
 23 more concise grouping. Vern reminded everyone of the four questions Jean had proposed
 24 to discuss once the first review of the alternatives was complete.

25
 26 **The group agreed to keep these alternatives on the list for further review. (Green)**

No. 48: Develop post GWAC education and outreach campaign.

No. 53: Develop a K-12 education program about groundwater and best management practices--mobile program visiting schools. *The group agreed this alternative needed to be kept and revised and noted the following items should be considered in future discussions: 1) there may be existing curricula that could be taught in the Lower Yakima Valley; and, 2) consider focusing education efforts on 11th and 12th grade students.*

No. 55: Educate the public, particularly in towns, about lawn and garden nitrogen applications' contribution to nitrate concentrations.

No. 21: Allocate cost share funding or other funding assistance to operators implementing environmental protection measures. *The group agreed to change "operators" to "people" and "environmental" to "groundwater."*

No. 114: Make grants that complement projects related to non-point source pollution. *The group agreed to change "non-point source" to "groundwater."*

No. 240: Request Washington Conservation Commission and WSU Extension to dedicate additional funding to the Yakima Valley for education and outreach, BMP implementation, irrigation water management, soil nutrient management and manure management and application.

No. 194: Create irrigation management plans (similar to nutrient management plans) for farms over a minimum size and provide financial assistance for implemented plans.

No. 202: Schedule water and nitrogen application according to the need for optimal crop yields.

No. 15: Focus implementation of analyzed data BMPs based on information and data included in the Nitrogen Loading Assessment, Soil Sampling Program, Ambient Groundwater Monitoring Plan, USGS Reports, and other similar scientifically based publications.

No. 85: Recommend that the Yakima Health District or Yakima County continue the High Risk Well Assessment (survey to identify outreach messaging related to health risks and well sampling) periodically over a 5-10 year period. Collect more information on wells known to have high nitrate concentrations, perhaps identifying whether the concentration is self-caused. *The group agreed to delete the first sentence: "Recommend that the Yakima Health District or Yakima County continue the High Risk Well Assessment (survey to identify outreach messaging related to health risks and well sampling) periodically over a 5-10 year period."*

No. 14: Collect, analyze, and interpret data to track water quality improvement progress, nutrients generated, applied, or exported, which will inform the implementation of an

Adaptive Management Plan within the LYV GWMA. *The group agreed to add the word "imported" before "generated."*

No. 136: Request that the Department of Ecology analyze the trends of nitrate data contained within reports required by NPDES and SDWA permits. *The group corrected "SDWA" to the correct reference which was "SWD."*

No. 78: Establish performance objectives against which monitoring data can be compared-- number of at risk wells, BMP implementation, funding success, reduction in number of underperforming farming practices.

No. 189: Monitor nitrate concentrations of irrigation water at head gates. *SVID (Ron Cowin) will share this information which is already being collected with USGS (Matt Bachmann).*

The group agreed to keep these on the list and consolidate them with similar alternatives.

(Yellow)

No. 51: Billboard campaign – urging well testing.

No. 160: Implement an Education and Outreach Program (EOP) informing producers of Best Management Practices (BMPs) including increased funding for the DNMP assistance program.

No. 16: Increase education and outreach efforts by improving the availability of technical assistance to develop nutrient management plans for all livestock industries. Assist industry trade organizations to enhance their local efforts to bring information to their members. Help increase livestock operator awareness of the need for procedures for proper management of animal wastes and wastewater. Potential funding sources include industry, government, educational institutions, grants, industry associations, etc.

No. 70: Enlist advocacy groups/Farm Bureau/federations/associations to host workshops/informational meetings regarding GWMA education goals and partnerships in success.

No. 71: Make presentations at trade shows, communicate with agricultural consultants who have positive relationships with farmers suggesting that they change practices.

No. 13: Inform livestock operators and facilitate a dialogue with representatives of the regulatory agencies, other agricultural producers, and the general public through a public information/education program to protect the quality of the area groundwater resource. Information and incentives provided to Lower Yakima Valley agricultural operators will expedite implementation of BMPs.

No. 52: Create 1 FTE Bilingual Outreach Coordinator Position to implement a post-adoption outreach campaign (EPO meeting summary 8/1/2014 & proposed to GWAC 8/21/14 - voted low priority).

No. 76: Provide education about concepts that people must understand in order to evaluate our plans for reducing nitrate in groundwater.

No. 190: Stimulate news coverage of progress in irrigation technology.

No. 242: Develop a system that could be used to determine which farmers need assistance in understanding appropriate farming practices--establish a structure of recommendations establishing clear expectations, list problematic management practices, encourage voluntary compliance, develop peer encouragement system.

No. 72: Partner with UW Pediatric Environmental Health Specialty Unit (PEHSU) to continue training local healthcare providers to recognize and address Nitrate risk in their patients (pregnant women and infants up to six months).

No. 67: Outreach targeted to small farm/hobby farm/ranchettes manure management.

No. 64: Prepare a fact sheet/develop outreach campaign to growers that explains agronomic rates, applying nutrients at the right time/right place/right amount.

No. 58: Publish public information about proper septic system construction and operation.

No. 56: Educate private well owners: Re: protect your family; know who's at risk; test your well regularly.

No. 57: Private well owners' responsibility to protect WQ.

No. 199: Manage sprinkler systems so they do not drive nutrients past the root system.

No. 200: Advise farmers of the relative propensity of wheel lines, center pivots, and drip lines to cause leaching.

No. 201: Use available techniques to determine how much and when irrigation is needed instead of irrigating according to a prearranged schedule.

No. 203: Analyze irrigation practices to discover whether frequency or volume creates greater propensity for leaching.

No. 210: Improve micro-irrigation system design and operation.

No. 198: Establish a voluntary irrigation management cost-share program with SYCD. Data shared with public.

No. 196: Provide funding for a mobile irrigation lab to assess the efficiency of current or advised irrigation practices, either through a singular lab or component parts.

No. 164: Collect data to track water quality improvement progress and nutrients generated, applied, or exported within the LYV GWMA. Generate data through soil testing, Ambient Groundwater Monitoring Plan implementation - including purpose built and

existing wells, sampling of liquid and solid waste to be field applied, composted, or exported, the CAFO General Permit, and tracking nutrients applied by non-dairy operations.

No. 77: Use both method-based measurement and performance-based measurement.

No. 4: Drill new 1,500 foot wells to replace contaminated wells.

No. 8: Discontinue use of shallow wells. Rebuild, repair or replace poorly constructed wells.

No. 61: Offer incentives to drill deeper wells for homeowners served by shallow, poorly constructed, poorly located wells.

No. 109: Drill deeper water wells further from septic drain systems.

The group agreed these alternatives should be removed from the list. (Red)

No. 47: Establish a more interactive and frequent relationship between Yakima County and NRCS.

No. 63: Provide a resource hotline (as proposed by RCIM on 8/2014).

No. 192: Incentives provide credit against county real property tax for investment in source abatement.

No. 238: Subsidize price of alfalfa to induce greater production so as to remove nitrogen from soils.

No. 191: Land acquisition purchase properties with greatest nitrate contribution and retire uses that generate nitrate.

No. 205: Upgrade irrigation districts' open, earthen or concrete delivery laterals and head ditches to PVC pipe.

No. 206: Route irrigation-return flow through a constructed managed wetland to reduce concentrations of nutrients and suspended sediment.

No. 207: Add polyacrylamide (PAM) to irrigation water.

No. 208: Install effective backflow prevention devices on supply lines of water supplied from groundwater wells to avoid backflow from chemigation.

No. 209: Structure irrigation water pricing by volume per acre used with preference for lower volume use.

No. 211: Recommend that irrigation districts be authorized to condition delivery of irrigation water on irrigation practices consistent with agronomic rate of application of water.

No. 193: Develop farmer-specific irrigation water use programs including collection of data, records of irrigation management, education of farmer regarding new processes and technology.

No. 82: Use hydro-geologically directed monitoring well placement to detect cause/effect remediation opportunities.

No. 86: Conduct recurrent drinking water testing where drinking water standards have previously been exceeded.

No. 12: Let the lead agency determine who will do monitoring. Possible assignment of long-term monitoring after 2017 to Yakima Health District.

No. 157: Establish a BMP monitoring well network. Monitor BMP performance and effectiveness with the monitoring well network first, then monitor water quality.

The group agreed to revisit these alternatives at a later date. (Blue)

No. 46: Measure the effects of GWAC program on Yakima County economics.

No. 30: Create an aquifer protection area.

No. 197: Provide financial assistance for 1) conversions from rill irrigation to sprinkler or drip irrigation, 2) installation of flow meters and moisture meters to reflect over-irrigation, high water table, drought conditions, 3) the cost of hiring third party sampling, measuring equipment, personnel or self-test kits, 4) management of sprinkler systems so they do not drive nutrients past the root system.

IV. Committee Business: A member was concerned that GWAC members were discussing GWMA information with others. She was also concerned about the accuracy of their discussions. Her first concern was that she had heard from someone else that Rand Elliott stated during a presentation to the Yakima Farm Bureau that small farmers are the biggest part of the (nitrate) problem. Her concern was that the GWAC hadn't evaluated testing and therefore had not decided this. Her second concern was that the WSDA had presented the Nitrogen Availability Assessment to a group in Olympia prior to presenting it to the GWAC or to the working groups at their joint meeting. Vern stated that he had learned that WSDA had briefed a group of farmer representatives and lobbyists as a political courtesy prior to delivering the NAA to the GWAC to give them a heads up that the report was coming out. He noted that this information had come up during the Irrigated Ag Working Group meeting held earlier this week. Vern did not believe the NAA had been discussed with anyone else. Other members agreed. Vern verified that this had merely been a "heads-up" not a presentation of the draft report itself. Others agreed. Vern went on to say that whether this action was right or wrong the group needed to agree that they would not share information that had not been fully vetted.

205 The July 27, 2017 meeting summary could not be approved as it was not included in the
206 group's meeting packet.

207

208 **V. Public Comment:** A member of the public stated that he agreed it was difficult to track
209 changes made by BMPs unless you have a great deal of funding as most studies don't track
210 BMP changes well.

211

212 **VI. Next Meeting:** August 24, 2017.

213

214 **VII. Next Steps:** SVID (Ron Cowin) will share data it is already collecting on nitrate
215 concentrations of irrigation water at head gates with USGS (Matt Bachmann).

216

217 **VIII. Meeting Summary** approved by the GWAC on September 21, 2017.

YAKIMA VALLEY GROUNDWATER MANAGEMENT AREA ADVISORY COMMITTEE (GWAC)

MEETING SUMMARY

Thursday, August 24, 2017 – 5:00 p.m. – 7:00 p.m.

Radio KDNA Conference Rooms 1-2
121 Sunnyside Avenue, Granger, WA 98932

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:** This meeting was called to order at 5:05 PM by Vern Redifer, 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)	✓	
Ron Cowin	Roza-Sunnyside Joint Board of Control	✓	
	Roza-Sunnyside Joint Board of Control (alternate)		
Laurie Crowe	South Yakima Conservation District		✓

Rodney Heit	South Yakima Conservation District (alternate)		✓
John Van Wingerden III	Port of Sunnyside	✓	
Jay Decker	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		✓
Lucy Edmondson	U.S. Environmental Protection Agency	✓ Phone	
Nick Peak	U.S. Environmental Protection Agency (alternate)		✓
Elizabeth Sanchey	Yakama Nation		✓
Stuart Crane	Yakama Nation (alternate)	✓	
Virginia "Ginny" Prest	WA Department of Agriculture		✓
Gary Bahr	WA Department of Agriculture (alternate)		✓
Andy Cervantes	WA Department of Health		✓
Sheryl Howe	WA Department of Health (alternate)	✓	
David Bowen	WA Department of Ecology		✓
Sage Park	WA Department of Ecology (alternate)		✓
Lino Guerra	Hispanic Community Representative		✓
Rick Perez	Hispanic Community Representative (alternate)		✓
Jessica Black	Heritage University		✓
Matt Bachmann	USGS	✓ Phone	

13 **II. Welcome, Meeting Overview and Introductions:** Vern welcomed everyone and
 14 acknowledged the meeting lacked a quorum. The group agreed to move ahead with its
 15 review of the alternatives realizing absent members might desire to comment at a later
 16 date. Vern then reviewed the agenda – there were no additions. Everyone introduced
 17 themselves and paused for a moment of silence.

18
 19 **III. Continued Review and Discussion of Results of Survey Monkey on Alternative Land and**
 20 **Water Use Management Strategies for Reaching Program Goals and Objectives per WAC**
 21 **173-100-100(4):**

22
 23 The group agreed to keep these alternatives on the list for further review. (Green)
 24

No. 187: Incentivize development of technologies and provide information about improvements made in nutrient management and agronomic rate application of fertilizer by specific developing technologies. *The group agreed to take out the words "Incentivize development of technologies and."*

No. 225: Identify areas with highly permeable and susceptible soils where fertilization and pesticide application should be most carefully managed. *The group agreed to delete the words "and pesticide."*

No. 227: Amend the list of prohibited uses under the Critical Aquifer Recharge Area ordinance 16C.09.070 (6) to include activities that would add nutrients to the soil column beyond those amounts that can be taken up within a reasonable time by plant materials. ☐ Or perhaps, activities inconsistent with NCRS Code 590.

No. 125: Encourage municipalities within the GWMA to extend municipal sewer systems within urban growth areas and retire ROSS and LOSS.

No. 126: Encourage connection of residences within urban growth zones to sewer systems extended by municipalities.

No. 127: Encourage the development of group septage-management or treatment systems in areas outside urban growth zones where the density of residential development could exacerbate the effect of multiple OSS on groundwater quality.

No. 130: Request Yakima County Public Services to perform an engineering study of locations outside urban growth areas where there is rural residential medium to high density OSS and the nitrate concentration is greater than the state water quality standard where community waste water systems could feasibly be constructed in lieu of individual on-site septic systems.

No. 7: Construct a potable water line from nearby developed area into deadhead water stations at central rural location (permit potable water collection at deadhead water stations).

No. 145: Require new developments to address impacts on groundwater quality through permitting review of a site plan review criteria.

No. 232: Regulate synthetic fertilizer and amount of water used if manure application is going to be regulated.

The group agreed to keep these on the list and consolidate them with similar alternatives.

(Yellow)

No. 215: Provide funding for nutrient management education or information distribution.

No. 224: Where possible, apply nitrogen through to plant-specific root zone means, rather than broadcast application.

No. 5: Regionalize and connect users to a larger system with reliable quality water pipe connection to an existing system.

No. 62: Offer incentives to connect households on private wells near community water systems to connect to a community water system. (Nitrate Treatment Pilot Program-June 2011).

The group agreed these alternatives should be removed from the list. (Red)

No. 216: Make Dairy Nutrient Management Plan records available upon Department of Agriculture determination of potential excessive application of nutrients.

No. 235: Require that prescriptions for soil amendment with organic or inorganic fertilizers be written by certified professionals, and that purchases of inorganic fertilizers limited to those for which prescriptions have been written.

No. 236: Establish a safety coefficient limiting application of nitrogen, whether organic (manure) or inorganic (synthetic), to take into account the problem of intervening cause, e.g., change in the weather or water supply that makes the application or the prior application of nitrogen excessive in the event of change in anticipated circumstances.

No. 217: Incentivize investment in crops that require less fertilization, or which take up greater amounts of nitrogen.

No. 124: Amend authority of Department of Ecology to gain access to properties where manure is spread outside land subject to nutrient management plans.

No. 31: Consider the enactment of a county ordinance addressing the density of segments of nitrate producing agricultural activity within the areas currently zoned as agricultural within the GWMA.

No. 32: Consider creation of subcategories of agricultural zoning, limiting density in those areas where soils are more permeable or groundwater moves faster.

No. 33: Consider overlay zoning ordinance adding special groundwater conservancy restrictions to otherwise conventionally zoned properties. Uses consumptive of groundwater quality resources are precluded or more generally regulated. Uses that are not consumptive of groundwater quality resource are permitted. Specific limitations might include limitations of water use, drainage, development density, septic use.

No. 40: Consider density limitations, building codes for farm structures, development standards for farm activities.

No. 230: Place area wide limitation on number of acres where manure can be spread as fertilizer. Require permit to spread manure as fertilizer. Allow market in permits. Allow dairies to own permits which could be leased to other agricultural properties.

No. 34: Define conditional uses that can be allowed after assurance that groundwater resources would not be damaged.

No. 213: Establish water use domains (zones) to apply water use constraints, or well construction design constraints, for agricultural uses.

No. 226: Amend Yakima County Code 16C.09.070 to include excess fertilizer application (over agronomic rate) to list of prohibited uses within critical aquifer recharge areas. *The group discussed some changes to this alternative, but then decided to delete it.*

No. 44: Protect Critical Aquifer Recharge Areas.

No. 35: Consider a county ordinance concerning over application of manure.

No. 28: Enact County ordinances that would affect the problem grower.

No. 39: Establish a quota system through zoning regulations establishing how much nitrogen could be applied (based on agronomic rates for individual crop types) within fixed zones.

No. 41: Regulate crop mix to weight more toward nitrogen-light crops.

No. 45: Require bonding as prerequisite to permitting of livestock operations so as to assure financial capability for clean up in the instance of bankruptcy or other economic failure.

The group agreed to revisit these alternatives at a later date. (Blue)

No. 214: Develop and implement Nutrient Management Plans (NMPs) for all producers (those that apply manure and those that apply synthetic fertilizer that include annual soil testing for phosphorus and nitrogen and which follow available guidance (i.e. Land Grant University)) for developing appropriate land application rates for phosphorus and nitrogen. These NMPs can identify site specific conservation practices that are, or will be, implemented to minimize the transport of phosphorus or nitrogen to surface and ground waters. NMPs that are adaptive -- adjusted based on annual soil tests, the types of crops grown, and other site or field specific factors to allow producers to adjust their plans and practices as new information becomes available. *A member wondered if this was a voluntary or regulatory approach. Lucy Edmondson (EPA) stated that this would be a regulatory approach.*

No. 20: Voluntary development and implementation of NMPs by operations not already required to hold permits or a DNMP as an effective means of environmental protection.

- 131 **No. 219:** Integrate use of animal waste and synthetic fertilizer, balancing nutrient
132 application amounts so as to maximize crop production and full nitrogen uptake.
- 133 **No. 212:** Require irrigated agriculture nutrient management plans. Record the source and
134 type of fertilizer and number of acres fertilized with each.
- 135 **No. 220:** Track nutrients and their application regardless of the end user, including
136 commercial fertilizer.
- 137 **No. 221:** Keep track of synthetic fertilizer sales.
- 138 **No. 259:** Increase dedicated funding that requires Ecology to gather data, evaluate, and address the
139 environmental impact of intensive, industrial agriculture. *The group agreed to delete the phrases*
140 *"increase dedicated," and "that requires Ecology," and "intensive, industrial." They also agreed to*
141 *add the word "provide" at the beginning of the alternative so that it reads: "Provide funding to*
142 *gather data*
- 143 **No. 36:** Create county ordinance limiting total number or density of cows or dairies (lid).
- 144 **No. 37:** Adopt a LYC GWMA or county-wide CAFO ordinance.
- 145 **No. 180:** Treat manure supply in excess of that which can reasonably be applied as nutrient to
146 agricultural lands as a waste product. Apply waste management strategies including land disposal at
147 designated site, incineration, centralized waste-to-energy facility.
- 148 **No. 163:** Streamline current enforcement activities so as to improve customer service and
149 protocols, increase clarity of process, escalate enforcement for facilities not following management
150 practices, identify methods to discourage repeatedly unfounded complaints, and improve overall
151 transparency.
- 152
- 153 **IV. Committee Business:** No meeting summaries were approved.
- 154
- 155 **V. Public Comment:** A visitor stated that he had heard people claim over and over that dairies
156 didn't produce too much manure only to say later that they were shipping manure outside
157 of the GWMA. Another visitor indicated that he thought dairies had an incentive to over
158 apply manure on their own land because they're not paying for it.
- 159
- 160 The meeting adjourned at 6:56 PM.
- 161
- 162 **VI. Next Meeting:** September 7, 2017.
- 163
- 164 **VII. Next Steps:** None.
- 165
- 166 **VIII. Meeting Summary** approved by the GWAC on September 21, 2017.

YAKIMA VALLEY GROUNDWATER MANAGEMENT AREA ADVISORY COMMITTEE (GWAC)

MEETING SUMMARY

Thursday, September 7, 2017 – 5:00 p.m. – 7:00 p.m.

Yakima County Road Maintenance Conference Room
1216 South 18th Street, Yakima, WA 98901

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:** This meeting was called to order at 5:03 PM by Vern Redifer, 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)	✓	
Ron Cowin	Roza-Sunnyside Joint Board of Control	✓	
	Roza-Sunnyside Joint Board of Control (alternate)		
Laurie Crowe	South Yakima Conservation District		✓

Rodney Heit	South Yakima Conservation District (alternate)		✓
John Van Wingerden III	Port of Sunnyside	✓	
Jay Decker	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		✓
Lucy Edmondson	U.S. Environmental Protection Agency	✓	
Nick Peak	U.S. Environmental Protection Agency (alternate)		✓
Elizabeth Sanchey	Yakama Nation		✓
Stuart Crane	Yakama Nation (alternate)	✓	
Virginia "Ginny" Prest	WA Department of Agriculture	✓	
Gary Bahr	WA Department of Agriculture (alternate)	✓	
Andy Cervantes	WA Department of Health	✓	
Sheryl Howe	WA Department of Health (alternate)		✓
David Bowen	WA Department of Ecology	✓	
Sage Park	WA Department of Ecology (alternate)		✓
Lino Guerra	Hispanic Community Representative		✓
Rick Perez	Hispanic Community Representative (alternate)		✓
Jessica Black	Heritage University		✓
Matt Bachmann	USGS	✓	

13 **II. Welcome, Meeting Overview and Introductions:** Vern asked everyone to introduce
14 themselves and then pause for a moment of silence. Vern acknowledged Ginny Prest's
15 retirement from WSDA and the group thanked her for her work on the GWAC. Vern
16 reviewed the agenda and indicated it was his goal to complete the review of alternatives.
17 There were no additions to the agenda.

19 **III. Continued Review and Discussion of Results of Survey Monkey on Alternative Land and**
20 **Water Use Management Strategies for Reaching Program Goals and Objectives per WAC**
21 **173-100-100(4):**

23 The group agreed to keep these alternatives on the list for further review. **(Green)**

No. 172: Revise WAC 246-203-130 so that it defines "health hazard" and "nuisance" and includes specific and enforceable requirements designed to protect human health. *The group agreed to delete the words: "health hazard" and "nuisance."*

No. 27: Assess groundwater contamination potential, making use of the available information on soils, geology, and groundwater in order to identify those areas that are the most vulnerable to contamination. These areas may be closer to surface water, areas where recharge is faster or more frequent, or areas where shallow soils overlie soluble bedrock. Identify strategies upstream of sensitive areas to reduce contributions of nitrate sources.

No. 24: Overlay GIS density maps reflecting different sources of nitrogen in order to geographically indicate the total density from all sources.

No. 25: Map those areas that can tolerate more nitrogen application and areas that are more vulnerable to its application. *The group agreed to add at the end: "High risk vs. low risk (from immediate impact perspective)."*

No. 107: USGS Particle Tracking Model Overview--potentially combined with MT3D MODFLOW application to the vadose Zone.

No. 90: Recommend that Western Fertilizer Handbook, Western Plant Health Association, Ninth Edition (2002) be updated.

No. 87: Design and implement pilot studies focusing on innovative farm techniques which reduce nitrogen loading to crops and monitor results for future expansion of findings. *The group agreed to add at the end: WSU.*

No. 83: Building from the WSDA's Nitrogen Availability Assessment, develop a Nitrogen Loading Assessment for all agricultural, residential and commercial properties, using newly collected data. Hire a technical consultant to conduct a literature review to determine the most relevant information and accurate factors for use in the Nitrogen Loading Assessment. Periodically repeat the grower survey used in the Nitrogen Availability Assessment to compare against the currently established data. Collect data on how many acres in the GWMA are fertilized in various crops with manure and how many with commercial fertilizer. Update and monitor the percentage of acreage in various crops, particularly silage corn and field corn. Study effect of contribution of nitrogen from cover crops used to form mulch. Determine acreage for triticale. Discover commercial fertilizer tonnage for Yakima County and/or for GWMA. Explore how much nitrogen leaches into groundwater from drains and wasteways. Study atmospheric deposition more comprehensively. Understand the difference between plant uptake and plant removal of nitrogen.

No. 89: Recommend that WSU Extension Service update Appendices A and B of the Washington Irrigation Guide.

No. 92: Develop Nitrogen Loading Assessment as provided in Research and Data Collection above.

No. 150: Explore public investment in waste to energy technology. *The group agreed to delete the word "public."*

No. 153: Use commodity group "check off" money for research and development.

No. 241: Monitor changes occurring in agricultural operations because of efficiencies and economics. Evaluate whether those changes positively affect improvement in groundwater quality. *The group agreed to delete "because of efficiencies and economics" and add the word "and" before the word evaluate.*

No. 111: Publish and distribute homeowner guide on how to use septic systems. *The group agreed to change the word "use" to "maintain."*

No. 108: Study potential nitrate contamination attributable to improperly operated septic systems. Consider restoration/retrofit of older septic systems through incentives or county property tax breaks.

No. 129: Request that the Yakima Health District prepare a plan, as required and described by WAC 246-272A-0015, giving primary emphasis on educational programs for operation and maintenance of existing on-site septic systems (OSS), reserving a determination regarding the advisability of the establishment of regulatory or enforcement programs until data is available from the GWMA's monitoring well system.

No. 143: Make facility process improvements in waste treatment and food processing plants to reduce nitrogen and total discharge volume.

No. 144: Replace aging sewer system infrastructure and ensure proper system maintenance to reduce nitrate leaching.

No. 134: Request that the State Department of Health determine, prior to issuing or reissuing LOSS permits, that all employee counts are regularly reported, so that the LOSS will continue to operate as designed.

No. 135: Recommend that the State Department of Health consider not approving additional LOSS or otherwise require an effective nitrate removal system.

No. 42: Consider limitation of septic systems (therefore building permit) where soil filtration rate is high, where housing density is already big, where nitrate concentration is already great downstream of the septic plume.

No. 132: Request the Yakima Health District to consider the nitrate density element when approving proposed septic systems, including those technologies verified by the U.S. EPA's Environmental Technology Verification Program, for reducing the nutrient nitrogen in domestic wastewater discharged from OSS, including fixed film trickling filter biological

treatment, media filter biological treatment, and submerged attached-growth biological treatment.

No. 175: Provide underlying soils information to each livestock operation so that individual evaluations can be made. *The group agreed that this was part of the DNMP.*

No. 183: Anecdotal results of deep soil sampling carried out by SYCD with farmers with pre-existing relationship with SYCD were informative. Word-of-mouth reporting within farmer community greatly increased acres sampled. Establish a multi-year deep soil sampling program where farmers subscribe for a duration with pre-determined fiscal remuneration for completed sampling. Cost share with farmer. Farmer to provide checklist indicating performance with BMPs. Test throughout growing year, in order to observe effects of fertilization throughout year. Share data with public.

No. 184: Do deep soil sampling on fields within GWMA that apply biosolids.

No. 185: Make shallow (1, 2, 3 foot) soil testing reports prerequisites for funding, lending or building permits.

No. 99: Put request for \$\$\$ for SYCD in State Conservation Commission budget.

No. 146: Identify and support opportunities, including educational research institutions, for private, public, and industry investment in technology specific to addressing nitrate contamination in groundwater.

No. 167: Incentivize technology and management of fertilizers and manures.

No. 168: Install separation systems--separate liquids from solids.

No. 188: Commission the creation of a data assembly software that could receive, translate, assemble and analyze the data produced by agricultural equipment technology manufactured by different agricultural equipment manufacturers, so as to permit integration of data per field, crop or enterprise.

No. 112: Publish the Department of Ecology's lists of certified laboratories that can test private wells for nitrates and pathogens and Ecology's providing funding to low income, private well users, in order to conduct this testing.

No. 2: Pump-and-fertilize. Use existing (or new) agricultural water wells to remove nitrate-contaminated groundwater and treat the water by using it to irrigate crops which will take up the nitrogen concentration in the irrigation water (presumes the existence of a proper nutrient management plan for the irrigated acreage).

No. 244: Recommend against farming around a water well.

No. 247: Consider costs of health risks to families from nitrate exposures, costs incurred by growers and producers of various recommendations, costs of bottled water, costs to connect to public water or sewer systems, cost for WSDA to monitor DNMP, costs of soil sampling.

No. 22: Develop strategies for marketing the economic, fertilizer value, and soil enhancing properties of appropriate application of manure and other livestock wastes.

The group agreed to keep these on the list and consolidate them with similar alternatives.

(Yellow)

No. 26: Use USGS particle tracking model to indicate where groundwater moves faster (permeability).

No. 104: Develop water absorption graph or chart. List volumes of water applied, soil types, absorption/compaction rates, depths to water, pre-season and post-season appropriate moisture levels. *The group agreed to add at the end: "Holding capacity, infiltration rate, evapotranspiration."*

No. 239: Monitor the timing of application of fertilizers to fields and how much water was then applied.

No. 149: Require nitrogen reducing technologies for onsite septic systems if and where appropriate.

No. 141: Assist hobby farmers to locate ROSS drain fields on their property so as to avoid animal farming over the drain field. The group agreed to suggest this be a part of septic maintenance literature).

No. 169: Use anaerobic digestion in waste storage lagoons. *The group agreed to add at the end the word "bmp."*

No. 246: Refrain from tilling under herbaceous remnants of prior crops, reducing plant nitrogen contributions to soil column. *The group agreed to add the word "bmp."*

No. 177: Prevent contaminants from flowing into wells by ensuring that the external areas around well casings are properly sealed and that wastes are kept the recommended distance from wells.

The group agreed these alternatives should be removed from the list. (Red)

No. 234: Require a synthetic fertilizer or other nutrient applicators license (approach taken by pesticides, chemigation and fertigation) as condition to purchase nutrients.

No. 237: Place a small tax on sale of synthetic fertilizer in order to collect volume data.

No. 105: Use USGS Particle Tracking Model.

No. 106: Use USGS particulate tracking model to identify targets of education.

No. 65: Study report outreach: Show/Identify how much nitrogen is left after nutrient uptake in crops.

No. 84: Get fertilizer loading numbers per crop type. Get economic engine factors per crop type. Determine crop/fertilizer utility ratios. Consider economic benefit of various crop type categories. Consider agricultural usage categories (e.g., field crop, row crop, vineyard, orchard, dairy. Determine amount of land appropriate for each, and location best for each given soil, climate, effect upon groundwater, etc. Ensure adequate supply of each in order to permit opportunity of market choice.

No. 91: Fund professional adaptation of Utah Fertilizer Guide for Washington State
http://extension.usu.edu/files/publications/publication/AG_431.pdf

No. 54: Employ/enlist college students to conduct surveys, consider outreach methodologies as part of classwork to assist with GWMA education.

No. 88: Explore whether nitrate leaching is greater with vetch amended soil or commercial fertilizer amended soil. The results of one study indicate that vetch nitrogen, in comparison to fertilizer nitrogen, leads to lower concentrations of soil inorganic nitrogen and greater immobilization of added nitrogen in soil organic matter. This would reduce the potential for nitrate leaching.

No. 151: Promote new products that are found through research.

No. 152: Promote markets for those products.

No. 233: Question sellers of synthetic fertilizers in order to learn their objectives, plans, strategies, seeking to discover win/win opportunities.

No. 243: Investigate use of bio-char in lieu of nitrogen fertilizers.

No. 110: Require builders to demonstrate that septic system design will not add to nitrogen loading problem as condition of construction.

No. 43: Property tax for properties with onsite septic systems, waived in the case of proper inspection and pumping.

No. 133: Recommend that soil testing be performed below at least two ROSS drain fields (one with a shallow water table, one with a deeper water table) in high density areas to analyze nitrogen loads as the septage approaches the water table.

No. 113: Encourage an increase in the number and availability of soil testing laboratories.

No. 186: Hire soil scientists to do publicly funded "spot auditing" soil checks for feedback to farmers and fertilizer sellers.

No. 103: Provide better funding and more staffing for Conservation District: hard money funding, increase property tax assessment, create exceptions to taxation for demonstrated testing and monitoring.

No. 147: AKART--industry can't keep up with technology, required if performance already meets performance standards?

No. 148: AKART--industry can't keep up with technology, required if performance already meets performance standards?

No. 3: Fill irrigation ditches with water and let it sit there to leak into groundwater. Use groundwater recharge as a means to dilute nitrate concentrations in the groundwater.

No. 9: Remediate local nitrate contamination hotspots only.

No. 245: Intermittent fallowing (leaving lands dormant) to reduce both natural plant nitrogen and fertilizer nitrogen additions to the soil.

No. 6: Blend better quality water with contaminated water to reduce nitrate concentrations.

The group agreed to revisit these alternatives at a later date. [Blue]

No. 162: Increase funding for the local Conservation District and Natural Resources Conservation Service (NRCS) so that assistance programs for nutrient management planning, engineering, cost share, and loan funds are more available.

No. 102: Recommend funding for Southern Yakima Conservation District review of Dairy Nutrient Management Plans.

No. 98: Fund post GWMA education and outreach through Conservation District.

No. 97: Ask SYCD for projected plan to expand fiscal and administrative capacity.

No. 100: Enhance engineering expertise (personnel) within Conservation District--none there or at NRCS.

No. 131 was deleted.

IV. Committee Business: No meeting summaries were approved.

V. Public Comment: There was none. The meeting adjourned at 7:37 PM.

VI. Next Meeting: September 21, 2017.

Next Steps: None.

VII. Meeting Summary approved by the GWAC on September 21, 2017.

YAKIMA VALLEY GROUNDWATER MANAGEMENT AREA ADVISORY COMMITTEE (GWAC)

MEETING SUMMARY

Thursday, September 21, 2017 – 5:00 p.m. – 7:00 p.m.

Denny Blaine Boardroom

810 Custer Avenue, Sunnyside, WA 98944

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: This meeting was called to order at 5:04 PM 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)		✓
Ron Cowin	Roza-Sunnyside Joint Board of Control	✓	
	Roza-Sunnyside Joint Board of Control (alternate)		
Laurie Crowe	South Yakima Conservation District	✓	

Groundwater Management Area (GWMA):

The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards

Rodney Heit	South Yakima Conservation District (alternate)		
John Van Wingerden III	Port of Sunnyside		✓
Jay Decker	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		✓
Lucy Edmondson	U.S. Environmental Protection Agency	✓	
Nick Peak	U.S. Environmental Protection Agency (alternate)		✓
Elizabeth Sanchey	Yakama Nation		✓
Stuart Crane	Yakama Nation (alternate)	✓	
Gary Bahr	WA Department of Agriculture	✓	
	WA Department of Agriculture (alternate)		
Andy Cervantes	WA Department of Health	✓	
Sheryl Howe	WA Department of Health (alternate)		✓
David Bowen	WA Department of Ecology	✓	
Sage Park	WA Department of Ecology (alternate)		✓
Lino Guerra	Hispanic Community Representative		✓
Rick Perez	Hispanic Community Representative (alternate)		✓
Jessica Black	Heritage University		✓
Matt Bachmann	USGS	✓	

II. Welcome, Meeting Overview and Introductions: Everyone introduced themselves. The group paused for a moment of silence. Jim asked if anyone had any additions to the agenda. One member wished to discuss how the GWAC's ultimate recommendations would be paid for. Another member wished to discuss solutions that address the needs of people in the GWMA target area whose wells have nitrates greater than 10 mg/L, citing the "Immediate Public Health Needs" on page 21 of the GWMA Work Plan. Another member wished to discuss the initial results from the USGS sampling program. All these matters were deferred.

III. Meeting Summaries: Jim moved approval of prior meeting summaries from July 27, August 10, August 24, and September 7 up to the front of the agenda. The summaries were approved as presented.

IV. Working Group Reports: There were none.

V. Continued Review and Discussion of Results of Survey Monkey on Alternative Land and Water Use Management Strategies for Reaching Program Goals and Objectives per WAC 173-100-100(4):

The group agreed to keep these alternatives on the list for further review. (Green)

No. 30: Create an aquifer protection area. *The group deleted the word "Create" and replaced it with "Postpone a decision on creation of." They also added "until a later date when more information is known" at the end of the sentence.*

No. 20: Voluntary development and implementation of NMPs by operations not already required to hold permits or a DNMP as an effective means of environmental protection.

No. 93: Summarize the DNMP reporting and provide information that would disclose the amount of manure the CAFOs in the GWMA created and where it was distributed. *The group changed "the DNMP" to "the industry-wide NMP"; added "to the public" after "disclose"; and deleted "where it was distributed", replacing it with "to whom it was delivered."*

No. 163: Streamline current enforcement activities so as to improve customer service and protocols, increase clarity of process, escalate enforcement for facilities not following management practices, identify methods to discourage repeatedly unfounded complaints, and improve overall transparency. *The group added "intentionally" in front of "not following", and added "(particularly repeat offenders)" after "management practices."*

EPA Submission 3: Old version: If there are any drinking water wells near and downgradient of a dairy that exceed the Maximum Contaminant Level (MCL) for nitrate, install groundwater monitoring wells, upgradient and downgradient, to assess whether the dairy is contributing to the loading of nitrates. ***New approved version:*** *If there are drinking water wells that have had a comprehensive site assessment and that exceed the Maximum Contaminant Level (MCL) for nitrate, investigate causes and consider sampling additional wells, upgradient and downgradient, to assess the source of the nitrate.*

No. 97: Ask SYCD for projected plan to expand fiscal and administrative capacity.

No. 102: Recommend funding for Southern Yakima Conservation District review of Dairy Nutrient Management Plans. *The group deleted the word "review" and replaced it with "update."*

No. 197: Provide financial assistance for 1) conversions from rill irrigation to sprinkler or drip irrigation, 2) installation of flow meters and moisture meters to reflect over-irrigation, high water table, drought conditions, 3) the cost of hiring third party sampling, measuring equipment, personnel or self-test kits, 4) management of sprinkler systems so they do not drive nutrients past the root system. *Members felt this could be combined with No. 162, although it was labelled green after some discussion.*

The group agreed to keep these on the list and consolidate them with similar alternatives.

(Yellow)

No. 162: Increase funding for the local Conservation District and Natural Resources Conservation Service (NRCS) so that assistance programs for nutrient management planning, engineering, cost share, and loan funds are more available. *The group added "NRCS" after "Increase". They also deleted "the local Conservation District and Natural Resources Conservation Service (NRCS) so that" and "are more available."*

The group either agreed these alternatives should be removed from the list, or were not able to reach consensus on them. (Red)

No. 1: Pump, treat and reinject groundwater.

No. 36: Create county ordinance limiting total number of density of cows or dairies (lid).

No. 37: Adopt a LYC GWMA or county-wide CAFO ordinance.

No. 94: Review and evaluate WSDA Dairy Nutrient Management Program inspection "protocols" to assist in determining if additional resources should be allocated and identify any areas for improvement of the inspections themselves.

No. 100: Enhance engineering expertise (personnel) within Conservation District – none there or at NRCS.

No. 251: Require WSDA to establish an air monitoring system for compliance with NRCS Standard 370 Atmospheric Resource Quality Management on Washington farms and to educate operations that do not comply with this standard.

The group agreed to revisit these alternatives at the next GWAC meeting. (Blue)

EPA Submission 1: Require regular examination of all underground pipes that transport liquid manure – using either with cameras or pressure tested, and require repairs if they are not intact. *The group deleted “regular examination” and replaced it with “biannual pressure testing.”*

EPA Submission 2: Consistent with the NRCS’ general recommendation, the use of lagoons should be avoided in watersheds with drinking water aquifers. Any new or existing lagoons in watersheds with drinking water aquifers should be equipped with engineered liners with a flexible membrane liner (FML) and a leak detection system.

No. 180: Treat manure supply in excess of that which can reasonably be applied as nutrient to agricultural lands as a waste product. Apply waste management strategies including land disposal at designated site, incineration, centralized waste-to-energy facility.

No. 249: Enforce RCW 70.95.020, RCW 70.95.100, RCW 70.95.160, RCW 70.95.165, RCW 70.95.179, RCW 70.95.180, RCW 70.95.185, RCW 70.95.200, RCW 70.95.205, RCW 70.95.240, RCW 70.95.280, RCW 70.95.285, RCW 70.95.290, RCW 70.95.300, RCW 70.95.305, RCW 70.95.306, RCW 70.95.310, and RCW 70.95.315 **(Note - RCW Chapter 70.95 is titled “Solid Waste Management - Reduction and Recycling”).** *Jean agreed to narrow the focus of this proposed alternative.*

No. 250: Enforce WAC 173-350-010, WAC 173-350-040, WAC 173-350-200, WAC 173-350-220, WAC 173-350-225, WAC 173-350-230, WAC 173-350-320, WAC 173-350-330, WAC 173-350-500, WAC 173-350-700, WAC 173-350-710, and WAC 173-350-715 **(Note - WAC Chapter 173-350 is titled (Solid Waste Handling Standards”).** *Jean agreed to narrow the focus of this proposed alternative.*

No. 257: Enforce RCW 70.94.011, 70.94.040, RCW 70.94.141, RCW 70.94.151, RCW 70.94.152, RCW 70.94.153, RCW 70.94.154, RCW 70.94.161, RCW 70.94.181, RCW

70.94.331, RCW 70.94.380 (Note - RCW Chapter 70.94 is titled "Washington Clean Air Act").

Jean agreed to narrow the focus of this proposed alternative.

No. 258: Enforce WAC 173-442-030, WAC 173-442-040, WAC 173-442-050, WAC 173-442-060, WAC 173-442-070, WAC 173-442-160, WAC 173-442-170, WAC 173-442-200, WAC 173-442-210, and WAC 173-442-220 (Note - WAC Chapter 173-442 is titled "Clean Air Rule"). Jean agreed to narrow the focus of this proposed alternative.

Nos. 98, 212, 214, 219, 220, 221, 259, and 46: These items were not discussed.

VI. Public Comment: A member of the public expressed concerns over the GWAC process, including the Irrigated Ag Working Group's meeting schedule, what the member saw as an inadequate number of farmers and growers engaged in irrigated agriculture, and that the potential for regulatory solutions would disproportionately harm small farmers.

VII. Adjournment: The meeting adjourned at 7:35 PM.

VIII. Next Meeting: October 5, 2017.

IX. Next Steps: 1) All blue items will be discussed at the next GWAC meeting. 2) Jean will narrow the focus Nos. 249, 250, 257 and 258 to get to the essence of her concern. 3) Funding sources for GWAC proposals will be discussed at a future GWAC meeting. 4) Solutions that address the needs of people in the GWMA target area whose wells have nitrates greater than 10 mg/L will be discussed at a future GWAC meeting. 5) Results from the USGS sampling program will be presented at a future GWAC meeting.

X. Meeting Summary approved by the GWAC on October 5, 2017.

Meeting Time and Location

Thursday, July 13, 2017 5:00 p.m. – 7:00 p.m.

Yakima County Road Maintenance Conference Room
1216 South 18th Street
Yakima, WA 98901

Agenda

Time	Topic	
5:00 – 5:10 p.m.	Welcome, Meeting Overview and Introductions: <ul style="list-style-type: none"> Committee members Others attending the meeting 	Vern Redifer, Facilitator
5:10 – 5:30 p.m.	Working Group Reports: <ul style="list-style-type: none"> Data Collection Livestock/CAFO IAWG RCIM Regulatory Framework EPO Funding 	Melanie Redding David Bowen Troy Peters Dan DeGroot Jean Mendoza Lisa Freund Vern Redifer
5:30 – 6:50 p.m.	Alternative Land and Water Use Management Strategies for Reaching Program Goals and Objectives per WAC 173-100-100(4) <ul style="list-style-type: none"> Review Results of Survey Monkey Discuss 	Jim Davenport
6:50 – 6:55 p.m.	Approve the June 29, 2017 GWAC Meeting Summary	Vern
6:55 – 7:00 p.m.	Public Comment	
7:00 p.m.	Adjourn	



Groundwater Management Area (GWMA):

The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards

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
Ron Cowin	Sunnyside-Roza Joint Board of Control
Laurie Crowe, Ron Heit (alternative)	South Yakima Conservation District
Robert Farrell, John Van Wingerden (alternate)	Port of Sunnyside
Rand Elliott, Vern Redifer (alternate)	Yakima County Commission
Dave Cole, Ryan Ibach (alternate)	Yakima Health District
Dr. Troy Peters	WSU Irrigated Agriculture Research and Extension Center
Lucy Edmondson, Nick Peak (alternate)	U.S. Environmental Protection Agency
Elizabeth Sanchey, Stuart Crane (alternate)	Yakama Nation
Virginia "Ginny" Prest Gary Bahr (alternate)	Washington Department of Agriculture
Andy Cervantes, Sheryl Howe (alternate)	Washington Department of Health
David Bowen, Sage Park (alternate)	Washington Department of Ecology
Lino Guerra, Rick Perez (alternate)	Hispanic Community Representative
Matt Bachmann	U.S. Geological Survey

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.

2017 Meeting Dates:

(Red text reflects new meeting dates)

February 16

April 20

May 18

~~June 15~~

June 29

July 13

~~July 20~~

July 27

August 10

~~August 17~~

August 24

September 7

September 21

October 19

November 16

December 21



Groundwater Management Area (GWMA):

The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water

Meeting Materials:

Name	Date Provided	From
2017_06_29_2017 GWAC Meeting Draft Summary	7/6/2017	bobbie.brady@co.yakima.wa.us
Meeting Agenda	7/6/2017	bobbie.brady@co.yakima.wa.us
<i>No Working Groups have met since the last GWAC meeting on June 29. The Funding Working Group is scheduled to meet on July 12, 2017.</i>	N/A	N/A

D0003

DAILY SUN

P.O. Box 878 • 600 S. Sixth Street
Sunnyside, WA 98944
Phone (509) 837-4500
Fax (509) 837-6397

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INVOICE

Billing Date 07/05/17
Account Number 030110-00000
Telephone 509-574-2300

Yakima County Public Services
128 N. 2nd St. 4th Floor
Yakima, WA 98901

LEGAL ADVERTISING INVOICE

Item Invoiced	StartDate	EndDate	Insertions
Yakima County Notic	07/05/17	07/05/17	1
Invoice #: 100 FC3463-100-120 7/13 Mtg.			

↑
PLEASE INCLUDE
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ALL PAYMENTS

Total Due 52.50

Thank you!

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JUL 7 2017

PS ACCOUNT

Funding Control FC 3463-100-120-4410

Authorized By Jana Beck

Date Authorized 7-7-17

Affidavit of Publication

**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, July 13, 2017, at Yakima County Road Maintenance Conference Room, 1216 South 18th Street, Yakima, WA 98901 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.

If you are a person with a disability who needs any accommodation in order to participate in this program, you may be entitled to receive certain assistance at no cost to you. Please contact the ADA Coordinator at Yakima County no later than forty-eight (48) hours prior to the date service is needed. Yakima County ADA Coordinator
128 N. 2nd Street, Room B27
Yakima, WA 98901
(509) 574-2210

7-1-1 or 1-800-833-6384
(Washington Relay Services for deaf and hard of hearing)

Dated this Thursday, June 29, 2017

PUBLISHED: DAILY SUN NEWS
July 5, 2017

STATE OF WASHINGTON

County of Yakima

ss.

Roger Harnack, 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.

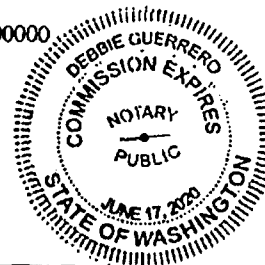
That the annexed is a true copy of a LEGAL PUBLICATION - Yakima County Public Services
FC3463-100-120 7/13 Mtg.

published in regular issues (and not in supplemental forms) of said newspaper once each week for a period of 1 consecutive issue(s) commencing 07/05/17 and ending on 07/05/17, 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 \$52.50, amount has been paid in full, at the rate of \$7.50 per column inch per insertion.

Subscribed and sworn to before me 07/05/17

Notary Public in and for the State of Washington

030110-00000



Y0060

YAKIMA HERALD REPUBLIC

INVOICE

114 N. 4th Street

PO Box 9668

Yakima, WA 98909

Date: 07/05/17

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 Fax:

Account Rep: Simon Sizer - Legals - 398

Phone #: (509) 577-7740

Email: sslizer@yakimaherald.com

Your Ad:

Yakima County

**Notice of Public Meeting
Lower Yakima Valley
Groundwater Advisory
Committee**

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Yakima Valley Groundwater
Advisory Committee on
Thursday, July 13, 2017, at
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Yakima, WA 98901 pursuant
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Ground Water Management
Areas and Programs.

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Yakima, WA 98901
(509) 574-2210
7-1-1 or 1-800-833-6384
(Washington Relay Services
for deaf and hard of hearing)

Dated this Thursday, June 29,
2017

(744330) July 5, 2017

Advertising The Yakima Herald-Republic:
Yakima County Notice of Public Meeti

Ad ID: 744330
Class: 6021
Run Dates: 07/05/17 to 07/05/17
of Inserts: 2
Total Inches: 8.0
Cost: \$112.64
Paid Amount: \$0.00

Amount Due: \$112.64

Funding Control _____

Authorized By _____

Date Authorized _____

RECEIVED

JUL C 2017

PS ACCOUNT

YAKIMA HERALD REPUBLIC

Affidavit of Publication

STATE OF WASHINGTON,)
)
COUNTY OF YAKIMA)

Danielle Rogers, being first duly sworn on oath deposes and says that she/he is the Accounting clerk of Yakima Herald-Republic, Inc., a daily newspaper. Said newspaper is a legal newspaper approved by the Superior Court of the State of Washington for Yakima County under an order made and entered on the 13th day of February, 1968, and it is now and has been for more than six months prior to the date of publication hereinafter referred to, published in the English language continually as a daily newspaper in Yakima, Yakima County, Washington. Said newspaper is now and has been during all of said time printed in an office maintained at the aforesaid place of publication of said newspaper.

That the annexed is a true copy of a:
Yakima County Notice of Public Meeti

it was published in regular issues (and not in supplement form) of said newspaper once each day and for a period of 1 times, the first insertion being on 07/05/2017 and the last insertion being on 07/05/2017

Yakima Herald-Republic 07/05/17
YakimaHerald.com 07/05/17

and the such newspaper was regularly distributed to its subscribers during all of the said period. That the full amount of the fee charged for the foregoing publication is the sum of \$112.64

Danielle Rogers

Accounting Clerk



Sworn to before me this 5th day of July 2017

Lisa M. Driggs
Notary Public in and for the
State of Washington,
residing at Yakima

Yakima County

**Notice of Public Meeting
Lower Yakima Valley
Groundwater Advisory
Committee**

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that Yakima County is holding
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Yakima Valley Groundwater
Advisory Committee on
**Thursday, July 13, 2017, at
Yakima County Road Main-
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1216 South 18th Street,
Yakima, WA 98901** pursuant
to Chapter 173-100-080 WAC
Ground Water Management
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(509) 574-2210
7-1-1 or 1-800-833-6384
(Washington Relay Services
for deaf and hard of hearing)*

Dated this Thursday, June 29,
2017

(744330) July 5, 2017

Courtesy of Yakima Herald-Republic

Meeting Time and Location

Thursday, July 27, 2017 5:00 p.m. – 7:00 p.m.

Radio KDNA Conference Rooms 1-2
121 Sunnyside Avenue
Granger, WA 98932

Agenda

Time	Topic	
5:00 – 5:10 p.m.	Welcome, Meeting Overview and Introductions: <ul style="list-style-type: none"> Committee members Others attending the meeting 	Vern Redifer, Facilitator
5:10 – 6:45 p.m.	Alternative Land and Water Use Management Strategies for Reaching Program Goals and Objectives per WAC 173-100-100(4) <ul style="list-style-type: none"> Continue Review of Survey Monkey Results Discuss 	Vern
6:45 – 6:50 p.m.	<ul style="list-style-type: none"> Approve the July 13, 2017 GWAC Meeting Summary 	Vern
6:50 – 6:55 p.m.	Public Comment	
7:00 p.m.	Adjourn	

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

Groundwater Management Area (GWMA):

The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards

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
Ron Cowin	Sunnyside-Roza Joint Board of Control
Laurie Crowe , Ron Heit (alternate)	South Yakima Conservation District
John Van Wingerden III, Jay Decker (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
Lucy Edmondson, Nick Peak (alternate)	U.S. Environmental Protection Agency
Elizabeth Sanchey, Stuart Crane (alternate)	Yakama Nation
Virginia "Ginny" Prest Gary Bahr (alternate)	Washington Department of Agriculture
Andy Cervantes, Sheryl Howe (alternate)	Washington Department of Health
David Bowen, Sage Park (alternate)	Washington Department of Ecology
Lino Guerra, Rick Perez (alternate)	Hispanic Community Representative
Matt Bachmann	U.S. Geological Survey

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.

Groundwater Management Area (GWMA):

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2017 Meeting Dates:

(Red text reflects new meeting dates)

February 16

April 20

May 18

~~June 15~~

June 29

July 13

~~July 20~~

July 27

August 10

~~August 17~~

August 24

September 7

September 21

October 19

November 16

December 21



Groundwater Management Area (GWMA):

The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water

Meeting Materials:

Name	Date Provided	From
2017_07_13 GWAC Meeting Draft Summary	7/19/2017 & At Table	bobbie.brady@co.yakima.wa.us
Meeting Agenda	7/20/2017	lisa.freund@co.yakima.wa.us
Copy of GWMA Survey Report-July 13, 2017	7/20/2017	lisa.freund@co.yakima.wa.us
Funding Working Group Meeting Summary of July 12, 2017	7/21/2017	lisa.freund@co.yakima.wa.us

D0003

DAILY SUN

P.O. Box 878 • 600 S. Sixth Street
Sunnyside, WA 98944
Phone (509) 837-4500
Fax (509) 837-6397

WE
GLADLY
ACCEPT



INVOICE

Billing Date 07/19/17
Account Number 030110-00000
Telephone 509-574-2300

Yakima County Public Services
128 N. 2nd St. 4th Floor
Yakima, WA 98901

LEGAL ADVERTISING INVOICE

Item Invoiced	StartDate	EndDate	Insertions
Yakima County Notice	07/19/17	07/19/17	1
Invoice #: 103 FC3463-100-120			

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PLEASE INCLUDE
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ALL PAYMENTS

Total Due 52.50

Thank you!

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JUL 21 2017

PS ACCOUNT

Funding Control FC 3463-100-120

Authorized By _____

Date Authorized _____

Affidavit of Publication

**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, July 27, 2017, at 5:00 PM at Radio KDNA Conference Rooms 1-2, 121 Sunnyside Avenue, Granger, WA 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/>

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If you are a person with a disability who needs any accommodation in order to participate in this program, you may be entitled to receive certain assistance at no cost to you. Please contact the ADA Coordinator at Yakima County no later than forty-eight (48) hours prior to the date service is needed.

Yakima County ADA Coordinator
128 N. 2nd Street, Room B27
Yakima, WA 98901
(509) 574-2210

7-1-1 or 1-800-833-6384
(Washington Relay Services for deaf and hard of hearing)
Dated this Thursday, July 13, 2017

PUBLISH: DAILY SUN NEWS
July 19, 2017

STATE OF WASHINGTON

SS.

County of Yakima

Roger Harnack, 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.

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Yakima County Public Services
FC3463-100-120

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Subscribed and sworn to before me 07/19/17

Notary Public in and for the State of Washington

030110-00000



Y0060

YAKIMA HERALD REPUBLIC

INVOICE

114 N. 4th Street

PO Box 9668

Yakima, WA 98909

Date: 07/19/17

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 Fax:

Account Rep: Simon Sizer - Legals - 398

Phone #: (509) 577-7740

Email: ssizer@yakimaherald.com

Your Ad:

Yakima County

**Notice of Public Meeting
Lower Yakima Valley
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7-1-1 or 1-800-833-6384
(Washington Relay Services
for deaf and hard of hearing)

Dated this Thursday, July 13,
2017

(747014) July 19, 2017

Advertising The Yakima Herald-Republic:
Yakima County Notice of Public Meeti

Ad ID: 747014
Class: 6021
Run Dates: 07/19/17 to 07/19/17
of Inserts: 2
Total Inches: 8.0
Cost: \$112.64
Paid Amount: \$0.00

Amount Due: \$112.64

Funding Control

Authorized By

Date Authorized

FC 3463-100-120
[Signature]
7/26/17

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JUL 25 2017
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YAKIMA HERALD REPUBLIC

Affidavit of Publication

STATE OF WASHINGTON,)

COUNTY OF YAKIMA)

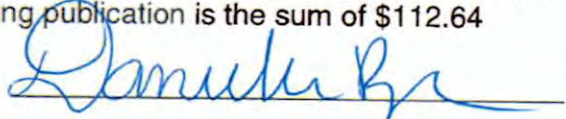
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Yakima Herald-Republic 07/19/17
YakimaHerald.com 07/19/17

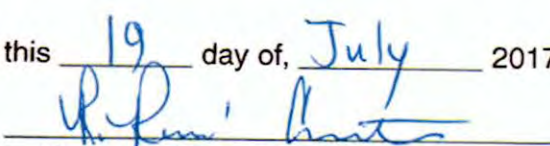
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Accounting Clerk



Sworn to before me this 19 day of, July 2017



Notary Public in and for the
State of Washington,
residing at Yakima

Yakima County

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(Washington Relay Services
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Dated this **Thursday, July 13,**
2017

(747014) July 19, 2017

Courtesy of Yakima Herald-Republic

Meeting Time and Location

Thursday, August 10, 2017 5:00 p.m. – 7:00 p.m.

Yakima County Road Maintenance Conference Room
1216 South 18th Street
Yakima, WA 98901

Agenda

Time	Topic	
5:00 – 5:10 p.m.	Welcome, Meeting Overview and Introductions: <ul style="list-style-type: none"> • Committee members • Others attending the meeting 	Vern Redifer, Facilitator
5:10 – 6:45 p.m.	Alternative Land and Water Use Management Strategies for Reaching Program Goals and Objectives per WAC 173-100-100(4) <ul style="list-style-type: none"> • Continue Review of Survey Monkey Results • Discuss 	Vern
6:45 – 6:50 p.m.	<ul style="list-style-type: none"> • Approve the July 27, 2017 GWAC Meeting Summary 	Vern
6:50 – 6:55 p.m.	Public Comment	
7:00 p.m.	Adjourn	

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Patricia Newhouse, Sue Wedam (alternate)	Lower Valley Community Representative Position 2
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Dr. Jessica Black	Heritage University
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John Van Wingerden, III, Jay Decker (alternate)	Port of Sunnyside
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Ryan Ibach	Yakima Health District
Dr. Troy Peters	WSU Irrigated Agriculture Research and Extension Center
Lucy Edmondson, Nick Peak (alternate)	U.S. Environmental Protection Agency
Elizabeth Sanchey, Stuart Crane (alternate)	Yakama Nation
Virginia "Ginny" Prest Gary Bahr (alternate)	Washington Department of Agriculture
Andy Cervantes, Sheryl Howe (alternate)	Washington Department of Health
David Bowen, Sage Park (alternate)	Washington Department of Ecology
Lino Guerra, Rick Perez (alternate)	Hispanic Community Representative
Matt Bachmann	U.S. Geological Survey

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August 24

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November 16

December 21



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Meeting Materials:

Name	Date Provided	From
2017_07_27 GWAC Meeting Draft Summary	7/31/2017	bobbie.brady@co.yakima.wa.us
Meeting Agenda	8/3/2017	Lisa.freund@co.yakima.wa.us



P.O. Box 878 • 600 S. Sixth Street
Sunnyside, WA 98944
Phone (509) 837-4500
Fax (509) 837-6397

WE
GLADLY
ACCEPT



D0003

INVOICE

Billing Date 08/02/17
Account Number 030110-00000
Telephone 509-574-2300

Yakima County Public Services
128 N. 2nd St. 4th Floor
Yakima, WA 98901

LEGAL ADVERTISING INVOICE

Item Invoiced	StartDate	EndDate	Insertions
Yakima County Notice	08/02/17	08/02/17	1
Invoice #: 106 FC3463-100-120 8/10 Mtg.			

↑
PLEASE INCLUDE
INVOICE NUMBER ON
ALL PAYMENTS

Total Due 52.50

Thank you!

RECEIVED
AUG 4 2017
PS ACCOUNT

Funding Control FC 3463-100-120
Authorized By [Signature]
Date Authorized 8/8/17

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PUBLISH: DAILY SUN NEWS
August 2, 2017

Affidavit of Publication

STATE OF WASHINGTON

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County of Yakima

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

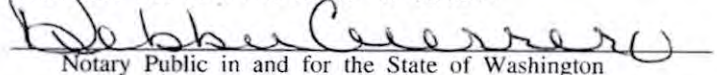
That said newspaper is a legal newspaper and it is now and has been for more than six months prior to the date of publications hereinafter referred to, published in the English language continually as a daily newspaper in the city of Sunnyside, YAKIMA County, Washington, and it is now and during all 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
FC3463-100-120 8/10 Mtg.

published in regular issues (and not in supplemental forms) of said newspaper once each week for a period of 1 consecutive issue(s) commencing 08/02/17 and ending on 08/02/17, 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 \$52.50, amount has been paid in full, at the rate of \$7.50 per column inch per insertion.



Subscribed and sworn to before me 08/02/17


Notary Public in and for the State of Washington

030110-00000



Y0060

YAKIMA HERALD REPUBLIC

INVOICE

114 N. 4th Street

PO Box 9668

Yakima, WA 98909

Date: 08/02/17

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 Fax:

Account Rep: Simon Sizer - Legals - 398

Phone #: (509) 577-7740

Email: ssizer@yakimaherald.com

Your Ad:

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, August 10, 2017, at the Yakima County Road Maintenance Conference Room, 1216 South 18th Street, Yakima, WA 98901** 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.

If you are a person with a disability who needs any accommodation in order to participate in this program, you may be entitled to receive certain assistance at no cost to you. Please contact the ADA Coordinator at Yakima County no later than forty-eight (48) hours prior to the date service is needed.

Yakima County ADA Coordinator
128 N. 2nd Street, Room B27
Yakima, WA 98901
(509) 574-2210
7-1-1 or 1-800-833-6384
(Washington Relay Services for deaf and hard of hearing)

Dated this **Thursday, July 27, 2017**

(750184) August 2, 2017

Advertising The Yakima Herald-Republic:
Yakima County Notice of Public Meeti

Ad ID: 750184
Class: 6021
Run Dates: 08/02/17 to 08/02/17
of Inserts: 2
Total Inches: 8.0
Cost: \$112.64
Paid Amount: \$0.00

Amount Due: \$112.64

Funding Control

FC 3463 -

Authorized By

[Signature]

Date Authorized

8/4/17

RECEIVED

AUG 3 2017

PS ACCOUNT

YAKIMA HERALD REPUBLIC

Affidavit of Publication

STATE OF WASHINGTON,)

COUNTY OF YAKIMA)

Danielle Rogers, being first duly sworn on oath deposes and says that she/he is the Accounting clerk of Yakima Herald-Republic, Inc., a daily newspaper. Said newspaper is a legal newspaper approved by the Superior Court of the State of Washington for Yakima County under an order made and entered on the 13th day of February, 1968, and it is now and has been for more than six months prior to the date of publication hereinafter referred to, published in the English language continually as a daily newspaper in Yakima, Yakima County, Washington. Said newspaper is now and has been during all of said time printed in an office maintained at the aforesaid place of publication of said newspaper.

That the annexed is a true copy of a:
Yakima County Notice of Public Meeti

it was published in regular issues (and not in supplement form) of said newspaper once each day and for a period of 1 times, the first insertion being on 08/02/2017 and the last insertion being on 08/02/2017

Yakima Herald-Republic 08/02/17
YakimaHerald.com 08/02/17

and the such newspaper was regularly distributed to its subscribers during all of the said period. That the full amount of the fee charged for the foregoing publication is the sum of \$112.64

Danielle Rogers

Accounting Clerk



Sworn to before me this 2nd day of August 2017

Lisa M. Driggs

Notary Public in and for the
State of Washington,
residing at Yakima

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, August 10, 2017,
**at the Yakima County Road
Maintenance Conference
Room, 1216 South 18th
Street, Yakima, WA 98901**
pursuant to Chapter 173-100-
080 WAC Ground Water Man-
agement Areas and Programs.

For Additional Information

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

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

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to you. Please contact the ADA
Coordinator at Yakima County
no later than forty-eight (48)
hours prior to the date service
is needed.

*Yakima County ADA
Coordinator
128 N. 2nd Street, Room B27
Yakima, WA 98901
(509) 574-2210
7-1-1 or 1-800-833-6384
(Washington Relay Services
for deaf and hard of hearing)*

Dated this **Thursday, July 27,**
2017

(750184) August 2, 2017

Courtesy of Yakima Herald-Republic

Meeting Time and Location

Thursday, August 24, 2017 5:00 p.m. – 7:00 p.m.

Radio KDNA Conference Rooms 1-2
121 Sunnyside Avenue
Granger, WA 98932

Agenda

Time	Topic	
5:00 – 5:10 p.m.	Welcome, Meeting Overview and Introductions: <ul style="list-style-type: none"> Committee members Others attending the meeting 	Vern Redifer, Facilitator
5:10 – 6:45 p.m.	Alternative Land and Water Use Management Strategies for Reaching Program Goals and Objectives per WAC 173-100-100(4) <ul style="list-style-type: none"> Continue Review of Survey Monkey Results Discuss 	Vern
6:45 – 6:50 p.m.	<ul style="list-style-type: none"> Approve the July 27, 2017 and the August 10, 2017 GWAC Meeting Summaries 	Vern
6:50 – 6:55 p.m.	Public Comment	
7:00 p.m.	Adjourn	

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
Ron Cowin	Sunnyside-Roza Joint Board of Control
Laurie Crowe, Rodney Heit (alternate)	South Yakima Conservation District
John Van Wingerden, III, Jay Decker (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
Lucy Edmondson, Nick Peak (alternate)	U.S. Environmental Protection Agency
Elizabeth Sanchey, Stuart Crane (alternate)	Yakama Nation
Virginia "Ginny" Prest Gary Bahr (alternate)	Washington Department of Agriculture
Andy Cervantes, Sheryl Howe (alternate)	Washington Department of Health
David Bowen, Sage Park (alternate)	Washington Department of Ecology
Lino Guerra, Rick Perez (alternate)	Hispanic Community Representative
Matt Bachmann	U.S. Geological Survey

Committee Ground Rules:

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



Groundwater Management Area (GWMA):

The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards

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

2017 Meeting Dates:

(Red text reflects new meeting dates)

February 16

April 20

May 18

~~June 15~~

June 29

July 13

~~July 20~~

July 27

August 10

~~August 17~~

August 24

September 7

September 21

October 19

November 16

December 21



Groundwater Management Area (GWMA):

The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water

Meeting Materials:

Name	Date Provided	From
2017_07_27 GWAC Meeting Draft Summary	7/31/2017	bobbie.brady@co.yakima.wa.us
2017_08_10 GWAC Meeting Draft Summary	8/16/2017	bobbie.brady@co.yakima.wa.us
Meeting Agenda	8/17/2017	Lisa.freund@co.yakima.wa.us
IAWG Working Group Meeting Summary of August 7, 2017	8/17/2017	Lisa.freund@co.yakima.wa.us

DAILY SUN

P.O. Box 878 • 600 S. Sixth Street
Sunnyside, WA 98944
Phone (509) 837-4500
Fax (509) 837-6397

WE
GLADLY
ACCEPT



D0003

INVOICE

Billing Date 08/16/17
Account Number 030110-00000
Telephone 509-574-2300

Yakima County Public Services
128 N. 2nd St. 4th Floor
Yakima, WA 98901

LEGAL ADVERTISING INVOICE

Item Invoiced	StartDate	EndDate	Insertions
Yakima County Notice	08/16/17	08/16/17	1
Invoice #: 109 FC3463-100-120 8/24 Mtg.			

↑
PLEASE INCLUDE
INVOICE NUMBER ON
ALL PAYMENTS

Total Due 48.75

Thank you!

RECEIVED

AUG 18 2017

PS ACCOUNT

Funding Control FC 3463-100-120-4410
Authorized By [Signature]
Date Authorized 8/18/17

Affidavit of Publication

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, August 24, 2017, at 5:00 PM at Radio KDNA, Conference Rooms 1-2, 121 Sunnyside Avenue, Granger, WA 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.

If you are a person with a disability who needs any accommodation in order to participate in this program, you may be entitled to receive certain assistance at no cost to you. Please contact the ADA Coordinator at Yakima County no later than forty-eight (48) hours prior to the date service is needed. Yakima County ADA Coordinator 128 N. 2nd Street, Room B27 Yakima, WA 98901 (509) 574-2210

7-1-1 or 1-800-833-6384 (Washington Relay Services for deaf and hard of hearing)

Dated this Thursday, August 10, 2017

PUBLISH: DAILY SUN NEWS August 16, 2017

STATE OF WASHINGTON

ss.

County of Yakima

Roger Harnack, 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 FC3463-100-120 8/24 Mtg.

published in regular issues (and not in supplemental forms) of said newspaper once each week for a period of 1 consecutive issue(s) commencing 08/16/17 and ending on 08/16/17, 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 \$48.75, amount has been paid in full, at the rate of \$7.50 per column inch per insertion.

Subscribed and sworn to before me 08/16/17

Notary Public in and for the State of Washington

030110-00000



Y0060

YAKIMA HERALD REPUBLIC

INVOICE

114 N. 4th Street

PO Box 9668

Yakima, WA 98909

Date: 08/16/17

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 Fax:

Account Rep: Simon Sizer - Legals - 398

Phone #: (509) 577-7740

Email: ssizer@yakimaherald.com

Your Ad:

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, August 24, 2017, at 5:00 PM at Radio KDNA, Conference Rooms 1-2, 121 Sunnyside Avenue, Granger, WA pursuant to Chapter 173-100-080 WAC Ground Water Management Areas and Programs.

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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/>

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Yakima, WA 98901
(509) 574-2210
7-1-1 or 1-800-833-6384
(Washington Relay Services
for deaf and hard of hearing)

Dated this **Thursday, August 10, 2017**

(753554) August 16, 2017

Advertising The Yakima Herald-Republic:
Yakima County Notice of Public Meeti

Ad ID: 753554
Class: 6021
Run Dates: 08/16/17 to 08/16/17
of Inserts: 2
Total Inches: 8.0
Cost: \$112.64
Paid Amount: \$0.00

Amount Due: \$112.64

Funding Control

FC 3463-100-120-4410

Authorized By

[Signature]

Date Authorized

8/18/17

RECEIVED

AUG 18 2017

PS ACCOUNT

YAKIMA HERALD REPUBLIC

Affidavit of Publication

STATE OF WASHINGTON

COUNTY OF YAKIMA

Jackie Chapman, being first duly sworn on oath deposes and says that she/he is the Accounting clerk of Yakima Herald-Republic, Inc., a daily newspaper. Said newspaper is a legal newspaper approved by the Superior Court of the State of Washington for Yakima County under an order made and entered on the 13th day of February, 1968, and it is now and has been for more than six months prior to the date of publication hereinafter referred to, published in the English language continually as a daily newspaper in Yakima, Yakima County, Washington. Said newspaper is now and has been during all of said time printed in an office maintained at the aforesaid place of publication of said newspaper.

That the annexed is a true copy of a:
Yakima County Notice of Public Meeti

it was published in regular issues (and not in supplement form) of said newspaper once each day and for a period of 1 times, the first insertion being on 08/16/2017 and the last insertion being on 08/16/2017

Yakima Herald-Republic 08/16/17
YakimaHerald.com 08/16/17

and the such newspaper was regularly distributed to its subscribers during all of the said period. That the full amount of the fee charged for the foregoing publication is the sum of \$112.64

Jackie Chapman
Accounting Clerk



Sworn to before me this 16th day of August 2017

Lisa M. Driggs
Notary Public in and for the
State of Washington,
residing at Yakima

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, August 24, 2017,
at 5:00 PM at Radio KDNA,
Conference Rooms 1-2, 121
Sunnyside Avenue, Granger,
WA pursuant to Chapter
173-100-080 WAC Ground
Water Management Areas and
Programs.

For Additional Information
To learn more about the
Lower Yakima Valley Ground-
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Lower Yakima Valley Ground-
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the County webpage at: [http://
www.yakimacounty.us/gwma/](http://www.yakimacounty.us/gwma/)

For more information about the
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Services Administrative Man-
ager at 574-2300.

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*Yakima County ADA
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128 N. 2nd Street, Room B27
Yakima, WA 98901
(509) 574-2210
7-1-1 or 1-800-833-6384
(Washington Relay Services
for deaf and hard of hearing)*

Dated this **Thursday, August**
10, 2017

(753554) August 16, 2017

Courtesy of Yakima Herald-Republic

Meeting Time and Location

Thursday, September 7, 2017 5:00 p.m. – 7:00 p.m.

Yakima County Road Maintenance Conference Room

1216 South 18th Street

Yakima, WA 98901

Agenda

Time	Topic	
5:00 – 5:10 p.m.	Welcome, Meeting Overview and Introductions: <ul style="list-style-type: none"> • Committee members • Others attending the meeting • Member Update 	Vern Redifer, Facilitator
5:10 – 6:45 p.m.	Alternative Land and Water Use Management Strategies for Reaching Program Goals and Objectives per WAC 173-100-100(4) <ul style="list-style-type: none"> • Continue Review of Survey Monkey Results • Discuss 	Vern
6:45 – 6:50 p.m.	<ul style="list-style-type: none"> • Approve the July 27, 2017, August 10, 2017, and August 24, 2017 GWAC Meeting Summaries 	Vern
6:50 – 6:55 p.m.	Public Comment	
7:00 p.m.	Adjourn	

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
Ron Cowin	Sunnyside-Roza Joint Board of Control
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John Van Wingerden, III, Jay Decker (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
Lucy Edmondson, Nick Peak (alternate)	U.S. Environmental Protection Agency
Elizabeth Sanchey, Stuart Crane (alternate)	Yakama Nation
Virginia "Ginny" Prest Gary Bahr (alternate)	Washington Department of Agriculture
Andy Cervantes, Sheryl Howe (alternate)	Washington Department of Health
David Bowen, Sage Park (alternate)	Washington Department of Ecology
Lino Guerra, Rick Perez (alternate)	Hispanic Community Representative
Matt Bachmann	U.S. Geological Survey

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

Groundwater Management Area (GWMA):

The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards

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2017 Meeting Dates:

(Red text reflects new meeting dates)

February 16

April 20

May 18

~~June 15~~

June 29

July 13

~~July 20~~

July 27

August 10

~~August 17~~

August 24

September 7

September 21

October 19

November 16

December 21



Groundwater Management Area (GWMA):

The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water

Meeting Materials:

Name	Date Provided	From
Meeting Agenda	8/31/2017	Lisa.freund@co.yakima.wa.us
2017_08_24 GWAC Meeting Draft Summary	8/28/2017	bobbie.brady@co.yakima.wa.us
2017_08_10 GWAC Meeting Draft Summary	8/16/2017	bobbie.brady@co.yakima.wa.us
2017_07_27 GWAC Meeting Draft Summary	7/31/2017	bobbie.brady@co.yakima.wa.us



P.O. Box 878 • 600 S. Sixth Street
Sunnyside, WA 98944
Phone (509) 837-4500
Fax (509) 837-6397

WE
GLADLY
ACCEPT



INVOICE

Billing Date 09/05/17
Account Number 030110-00000
Telephone 509-574-2300

Yakima County Public Services
128 N. 2nd St. 4th Floor
Yakima, WA 98901

LEGAL ADVERTISING INVOICE

Item Invoiced	StartDate	EndDate	Insertions
Yakima County Notice	08/30/17	08/30/17	1
Invoice #: 111 FC3463-100-120 9/7 Mtg.			

↑
PLEASE INCLUDE
INVOICE NUMBER ON
ALL PAYMENTS

Total Due 52.50

Thank you!

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SEP 08 2017

PS ACCOUNT

Funding Control FC 3463-100-120

Authorized By [Signature]

Date Authorized 9/8/2017

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, September 7, 2017, at the Yakima County Road Maintenance Conference Room, 1216 South 18th Street, Yakima, WA 98901 pursuant to Chapter 173-100-080 WAC Ground Water Management Areas and Programs.

For Additional Information

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(509) 574-2210

7-1-1 or 1-800-833-6384

(Washington Relay Services for deaf and hard of hearing)

Dated this Thursday, August 24, 2017

Publish: Wednesday, August 30, 2017

PUBLISH: DAILY SUN NEWS
August 30, 2017

Affidavit of Publication

STATE OF WASHINGTON

SS.

County of Yakima

Roger Harnack, 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 FC3463-100-120 9/7 Mtg.

published in regular issues (and not in supplemental forms) of said newspaper once each week for a period of 1 consecutive issue(s) commencing 08/30/17 and ending on 08/30/17, 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 \$52.50, amount has been paid in full, at the rate of \$7.50 per column inch per insertion.

Subscribed and sworn to before me 08/30/17

[Signature]
Notary Public in and for the State of Washington

030110-00000



YAKIMA HERALD REPUBLIC

Affidavit of Publication

STATE OF WASHINGTON,)
)
COUNTY OF YAKIMA)

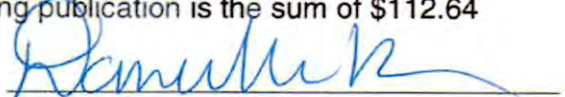
Danielle Rogers, being first duly sworn on oath deposes and says that she/he is the Accounting clerk of Yakima Herald-Republic, Inc., a daily newspaper. Said newspaper is a legal newspaper approved by the Superior Court of the State of Washington for Yakima County under an order made and entered on the 13th day of February, 1968, and it is now and has been for more than six months prior to the date of publication hereinafter referred to, published in the English language continually as a daily newspaper in Yakima, Yakima County, Washington. Said newspaper is now and has been during all of said time printed in an office maintained at the aforesaid place of publication of said newspaper.

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Yakima County Notice of Public Meeti

it was published in regular issues (and not in supplement form) of said newspaper once each day and for a period of 1 times, the first insertion being on 08/30/2017 and the last insertion being on 08/30/2017

Yakima Herald-Republic 08/30/17
YakimaHerald.com 08/30/17

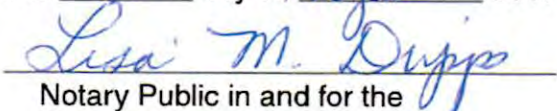
and the such newspaper was regularly distributed to its subscribers during all of the said period. That the full amount of the fee charged for the foregoing publication is the sum of \$112.64



Accounting Clerk



Sworn to before me this 30th day of August 2017



Notary Public in and for the
State of Washington,
residing at Yakima

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, September 7, 2017, at the Yakima County Road Maintenance Conference Room, 1216 South 18th Street, Yakima, WA 98901** 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.

If you are a person with a disability who needs any accommodation in order to participate in this program, you may be entitled to receive certain assistance at no cost to you. Please contact the ADA Coordinator at Yakima County no later than forty-eight (48) hours prior to the date service is needed.

*Yakima County ADA
Coordinator
128 N. 2nd Street, Room B27
Yakima, WA 98901
(509) 574-2210
7-1-1 or 1-800-833-6384
(Washington Relay Services
for deaf and hard of hearing)*

Dated this **Thursday, August 24, 2017**

(756275) August 30, 2017

Courtesy of Yakima Herald-Republic



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, September 21, 2017 5:00 p.m. – 7:00 p.m.

Denny Blaine Board Room, Sunnyside School District No. 201

610 East Custer

Sunnyside, WA 98944

Agenda

Time	Topic	
5:00 – 5:10 p.m.	Welcome, Meeting Overview and Introductions: <ul style="list-style-type: none"> • Committee members • Others attending the meeting • Member Update 	Jim Davenport, Facilitator
5:10 – 6:45 p.m.	Alternative Land and Water Use Management Strategies for Reaching Program Goals and Objectives per WAC 173-100-100(4) <ul style="list-style-type: none"> • Discuss Blue Items 	Jim
6:45 – 6:50 p.m.	<ul style="list-style-type: none"> • Approve the July 27, 2017, August 10, 2017, August 24, 2017, and September 7, 2017 GWAC Meeting Summaries 	Jim
6:50 – 6:55 p.m.	Public Comment	
7:00 p.m.	Adjourn	

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
Ron Cowin	Sunnyside-Roza Joint Board of Control
Laurie Crowe, Rodney Heit (alternate)	South Yakima Conservation District
John Van Wingerden, III, Jay Decker (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
Lucy Edmondson, Nick Peak (alternate)	U.S. Environmental Protection Agency
Elizabeth Sanchey, Stuart Crane (alternate)	Yakama Nation
Gary Bahr (alternate)	Washington Department of Agriculture
Andy Cervantes, Sheryl Howe (alternate)	Washington Department of Health
David Bowen, Sage Park (alternate)	Washington Department of Ecology
Lino Guerra, Rick Perez (alternate)	Hispanic Community Representative
Matt Bachmann	U.S. Geological Survey

Committee Ground Rules:

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



Groundwater Management Area (GWMA):

The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards

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

2017 Meeting Dates:

(Red text reflects new meeting dates)

February 16
April 20
May 18
~~June 15~~
June 29

July 13
~~July 20~~
July 27
August 10
~~August 17~~
August 24

September 7
September 21
October 5 Yakima
October 19 Sunnyside
November 2 Yakima
November 16
Sunnyside
December 7 Yakima
December 21
Sunnyside



Groundwater Management Area (GWMA):

The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water

Meeting Materials:

Name	Date Provided	From
Meeting Agenda	9/14/2017	bobbie.brady@co.yakima.wa.us
2017_09_07 GWAC Meeting Draft Summary	9/14/2017	bobbie.brady@co.yakima.wa.us
2017_08_24 GWAC Meeting Draft Summary	8/28/2017	bobbie.brady@co.yakima.wa.us
2017_08_10 GWAC Meeting Draft Summary	8/16/2017	bobbie.brady@co.yakima.wa.us
2017_07_27 GWAC Meeting Draft Summary	7/31/2017	bobbie.brady@co.yakima.wa.us

YAKIMA HERALD REPUBLIC

INVOICE

114 N. 4th Street

PO Box 9668

Yakima, WA 98909

Date: 09/13/17

Account #: 110536

Company Name: YAKIMA COUNTY SURFACE WATER MANAGEMENT **Your Ad:**

Contact: Tina Beck, AP

Address: 128 NORTH 2ND STREET ROOM 408
YAKIMA, WA 98901

Telephone: (509) 574-2343 Fax:

Account Rep: Simon Sizer - Legals - 398

Phone #: (509) 577-7740

Email: ssizer@yakimaherald.com

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, September 21, 2017, at 5:00 PM at Denny Blaine Boardroom, Sunnyside School District No. 201, 810 E. Custer, Sunnyside, WA 98944** pursuant to Chapter 173-100-080 WAC Ground Water Management Areas and Programs.

For Additional Information
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Dated this **Thursday, Sep-
tember 7, 2017**

(759448) September 13, 2017

Advertising The Yakima Herald-Republic:
Yakima County Notice of Public Meeti

Ad ID: 759448
Class: 6021
Run Dates: 09/13/17 to 09/13/17
of Inserts: 2
Total Inches: 8.125
Cost: \$116.16
Paid Amount: \$0.00

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YAKIMA HERALD REPUBLIC

Affidavit of Publication

STATE OF WASHINGTON,)

COUNTY OF YAKIMA)

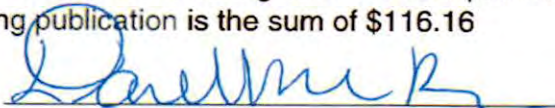
Danielle Rogers, being first duly sworn on oath deposes and says that she/he is the Accounting clerk of Yakima Herald-Republic, Inc., a daily newspaper. Said newspaper is a legal newspaper approved by the Superior Court of the State of Washington for Yakima County under an order made and entered on the 13th day of February, 1968, and it is now and has been for more than six months prior to the date of publication hereinafter referred to, published in the English language continually as a daily newspaper in Yakima, Yakima County, Washington. Said newspaper is now and has been during all of said time printed in an office maintained at the aforesaid place of publication of said newspaper.

That the annexed is a true copy of a:
Yakima County Notice of Public Meeti

it was published in regular issues (and not in supplement form) of said newspaper once each day and for a period of 1 times, the first insertion being on 09/13/2017 and the last insertion being on 09/13/2017

Yakima Herald-Republic 09/13/17
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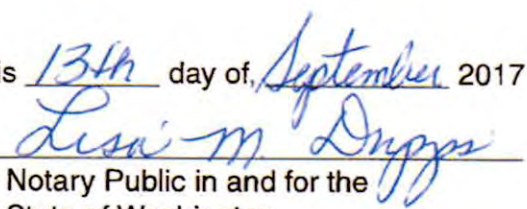
and the such newspaper was regularly distributed to its subscribers during all of the said period. That the full amount of the fee charged for the foregoing publication is the sum of \$116.16



Accounting Clerk



Sworn to before me this 13th day of September 2017



Notary Public in and for the
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Yakima County

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(759448) September 13, 2017

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Courtesy of Yakima Herald-Republic

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128 N. 2nd St. 4th Floor
Yakima, WA 98901

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Item Invoiced	StartDate	EndDate	Insertions
Yakima County Notice	09/13/17	09/13/17	1
Invoice #: 114 FC3463-100-120 9/21 Mtg.			

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Dated this Thursday, September 7, 2017

PUBLISH: DAILY SUN NEWS
September 13, 2017

STATE OF WASHINGTON

ss.

County of Yakima

Roger Harnack, 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.

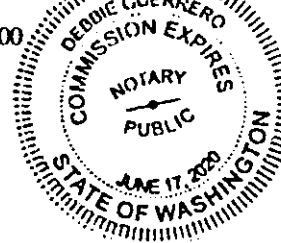
That the annexed is a true copy of a LEGAL PUBLICATION - Yakima County Public Services
FC3463-100-120 9/21 Mtg.

published in regular issues (and not in supplemental forms) of said newspaper once each week for a period of 1 consecutive issue(s) commencing 09/13/17 and ending on 09/13/17, 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 \$52.50, amount has been paid in full, at the rate of \$7.50 per column inch per insertion.

Subscribed and sworn to before me 09/13/17

Notary Public in and for the State of Washington

030110-00000



GWAC Attendance Roster

Member	13-Jul-2017	27-Jul-2017	10-Aug-2017	24-Aug-2017	7-Sep-2017	21-Sep-2017
Stuart Turner	Present	Absent	Absent	Absent	Absent	Present
Chelsea Durfey	Absent	Absent	Absent	Absent	Absent	Absent
Bud Rogers	Present	Present	Present	Present	Present	Present
Kathleen Rogers	Present	Present	Present	Present	Present	Absent
Patricia Newhouse	Absent	Present	Present	Present	Present	Present
Sue Wedam	Present	Present	Present	Present	Absent	Present
Doug Simpson	Present	Present	Absent	Absent	Absent	Absent
Jean Mendoza	Present	Present	Present	Present	Present	Present
Eric Anderson	Absent	Absent	Absent	Absent	Absent	Absent
Jan Whitefoot	Absent	Absent	Absent	Absent	Absent	Absent
Jim Dyjak	Present	Absent	Present	Absent	Absent	Present
Steve George	Present	Present	Present	Present	Present	Present
Frank Lyall	Present	Absent	Absent	Absent	Absent	Present
Jason Sheehan	Present	Present	Absent	Present	Present	Present
Dan DeGroot	Present	Present	Present	Present	Present	Present
Ron Cowin	Present	Absent	Present	Present	Present	Present
Laurie Crowe	Present	Present	Present	Absent	Absent	Absent
Ron Heit	Absent	Absent	Absent	Absent	Absent	Present
John Van Wingerden	Absent	Present	Present	Present	Present	Present
Jay Decker	Present	Absent	Absent	Absent	Absent	Absent
Rand Elliott	Present	Present	Present	Present	Present	Absent
Vern Redifer	Present	Present	Present	Present	Present	Absent
David Cole	Absent					
Ryan Ibach	Absent	Absent	Present	Absent	Absent	Absent
Dr. Troy Peters	Absent	Absent	Absent	Absent	Absent	Absent
Lucy Edmondson	Present	Absent	Present	Present	Present	Present
Peter Contreras/Nick Peak	Absent	Absent	Absent	Absent	Absent	Absent
Elizabeth Sanchez	Absent	Absent	Absent	Absent	Absent	Absent
Stuart Crane	Present	Absent	Present	Present	Present	Present
Virginia "Ginny" Prest	Absent	Present	Present	Absent	Present	Absent
Gary Bahr	Present	Absent	Absent	Absent	Present	Present
Andy Cervantes	Present	Present	Present	Absent	Present	Present
Sheryl Howe	Absent	Absent	Absent	Present	Absent	Absent
David Bowen	Present	Present	Present	Absent	Present	Present
Sage Park	Absent	Absent	Absent	Absent	Absent	Absent
Lino Guerra	Absent	Absent	Absent	Absent	Absent	Absent
Rick Perez	Absent	Absent	Absent	Absent	Absent	Absent
Jessica Black	Absent	Absent	Absent	Absent	Absent	Absent
Matt Bachmann	Present	Absent	Present	Present	Present	Present

Irrigated Ag Working Group (IAWG)

Charge from Groundwater Management Area Advisory Committee

Working Group Members

Dr. Troy Peters (GWAC-WSU); 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), Vern Redifer, Jim Davenport.

Meetings/Calls Dates

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

When: August 7, 2017, from 1:30 pm to 3:30 pm.

Call: (509) 574-2353 – Pin # 2353

Participants

Troy Peters (Chair), Vern Redifer, Kathleen Rogers, Jean Mendoza, Jim Davenport, Stuart Crane, Doug Simpson, Laurie Crowe, Rodney Heit, Gary Bahr, Perry Beale, Frank Lyall, Ron Cowin, Scott Stephen*, Chris Saunders (Yakima County Support Staff) *Present via telephone.

Key Discussion Points

Chair Troy Peters called the meeting to order at 1:30 pm.

Nitrogen Availability Assessment (NAA) Comments: After the customary introductions, the group began giving their feedback to Washington State Department of Agriculture (WSDA) officials Gary Bahr and Perry Beale concerning the Irrigated Ag section of the draft NAA.

A member pointed out that the first paragraph on page 30 states, "This assessment is not intended to evaluate the practices of individual farming operations within the GWMA." He then referred to Figure 8 on page 47, a map which depicted the medium-range nitrogen availability scenario within the GWMA. Land parcels colored in red depicted areas where nitrogen-rich products were potentially being applied at over 500 tons/year. The member felt this would be interpreted as indicting the practices of individual farmers on those parcels, and had been called a "litigation magnet" when it had been presented in Olympia. WSDA officials pointed to the language on

pages 30-31 under “limitations”, and the first paragraph on page 48, which laid out disclaimers explaining the uncertainties inherent in the survey data. They felt this would be sufficient to deter litigation.

Discussion ensued on the reliability of the sources that supplied the survey data. WSDA had collected data from a variety of sources, including crop consultants, agronomists, and telephone surveys of willing farmers. A group member felt this was mixing survey methods and that crop consultants, while an important part of the agriculture system, were too far divorced from on-the-ground field practices. While many farmers listen to consultants and agronomists, group members who were growers and consultants confirmed that they don’t always follow outside advice when it comes to applying fertilizer, manure, or compost to their fields. Troy and WSDA officials asked how they could communicate the limitations more effectively in the final draft. The group member felt most readers would focus on the maps without paying too much attention to the disclaimers, and that it would be better to drop the maps from the final draft altogether. He also felt that the NAA should have relied solely on application numbers supplied directly from farmers, and left out numbers from consultants. Another group member felt this was unrealistic, as participation the survey was voluntary, and many farmers declined to participate.

The first full paragraph on page 31 states that the NAA “does not include information on the use or benefits of nitrogen-fixing cover crops”, and that this was “beyond the scope of this study.” A group member felt that cover crops mattered tremendously to nitrogen levels in the soil. For example, cover crops such as pasture grass require additional nutrient application, can cover as much as 90 percent of the surface area in tree crops and vineyards, and can last for decades. He felt that Tables 13, 14, and 15 on pages 39, 43, and 44 did not present credible data as they didn’t take cover crops into account. WSDA officials stated they were already working on including cover crop data in the final draft, in response to written comments from members, and handed their initial findings out to the group. Their data was based conversations with WSU crop specialists, which led to further questioning of the reliability of survey data by supplied by experts as opposed to growers.

The discussion moved on to Table 15, a chart depicting the sum of inputs and outputs for the top 15 crops in the GWMA. Several group members questioned the low-range estimate for juice grape growers, which showed a nutrient surplus of 312 tons spread out over the entire GWMA. They saw this figure as highly inaccurate, and questioned why some crops were shown with no nutrient surplus in the low-range, but others were shown with very large surpluses. Given the variability in farming practices, a member felt that zero should be the low-end estimate in all cases. Another member pointed out the apple grower line on Table 14, and questioned the high-range figure of 219 pounds of nutrients per-acre/per-year, and requested time to review the numbers. He also felt that the disclaimer language on page 43 explaining that nutrient application levels will change year-by-year could have been set out more clearly.

Some members felt that the tables showing low-, medium-, and high-range estimates should be removed from the final NAA. WSDA officials said these categories were included at the direction of the various working groups after the Livestock/CAFO working group decided to disaggregate their data in this fashion. They felt using one median number for different crop categories had its own statistical drawbacks in communicating accurate information to the public.

A group member asked for clarification on a group member's earlier comments that the draft NAA had been "presented" in Olympia. The group member who had made those comments clarified that the NAA itself had not been presented, but merely some of its findings, before various farm groups in Olympia shortly before the April 26th Joint Working Group meeting.

A group member who had submitted written comments brought up the "Soil organic matter conversion to nitrate" section on pages 35-36. She felt that the NAA was inappropriately using a one-size-fits-all percentage of approximately two percent when it came to organic matter readings, and that the figures in columns AC, AD, and AE in the WSDA's "Irrigated Crop N Mass Balance Table" depicting low-, medium-, and high-range soil conversion rates should either be left off or readjusted to account for variations in organic matter content. WSDA officials weren't sure there was a way to do that, even with deep soil sampling data, given that crops rotate year-by-year, but agreed to see what they could do.

A group member also raised questions about atmospheric deposition. This subject was briefly mentioned on page 34, and covered in more depth in a separate section of the NAA, on pages 66-69. Table 31 on page 69 lists the estimated total atmospheric deposition in the GWMA in tons of nitrogen/year, but this information was not included in the Irrigated Ag section. The member thought it should be.

Response to EPO Questionnaire No. 6: There was consensus among the group in support of greater education and outreach efforts. Laurie Crowe agreed to send the EPO working group some of the brochures produced by the South Yakima Conservation District (SYCD) on water and nutrient management practices, with an eye to being reformatted and mailed out by the GWMA's successor agency.

The meeting adjourned at 3:37 pm.

Recommendations for GWAC

Resources Requested

Deliverables/Products Status

Proposed Next Steps

Laurie Crowe will supply the EPO Working Group with the SYCD's brochures on water and nutrient management.

Funding Work Group

Charge from Groundwater Management Area Advisory Committee

Working Group Members

Vern Redifer (Chair); Bud Rogers; Dan DeGroot; David Bowen; Ginny Prest; Jason Sheehan; Jim Davenport; Laurie Crowe; Matt Bachmann; Rand Elliott; Rick Dinicola; Steve George; Stuart Turner.

Meetings/Calls Dates

Meeting: Wednesday, July 12, 2017, 5:00-7:30 PM
Call Number: 360-407-3780 PIN CODE: 3066589#

Participants

Present: Vern Redifer (Chair); Dan DeGroot; David Bowen; Jim Davenport; Laurie Crowe; Steve George; Jason Sheehan; Bud Rogers; Gary Bahr; Sandy Braden, Stuart Crane and Bobbie Brady (Yakima County Support Services). No one was available on the phone.

Key Discussion Points

The meeting began at 5:15 PM. Vern advised that the group would be discussing funding sources for several items that were sure to be a part of the proposed program. The discussion on each item was as follows:

Ambient Water Quality Monitoring and Drinking Water Well Monitoring Programs: A member wanted to know if well monitoring costs would include funding for analysis, sampling and review of data. Vern indicated that the Data Collection Working Group would be coming up with a plan for analysis of this data and added that all of the costs associated with monitoring would be in one package. Another member asked how long the monitoring would continue and stated that it was normal to compile data every year and analyze at five years. He added that some analysis could be done every year because there are seasonal variations. Gary said that five years of quarterly sampling would provide seasonal information and that brief updates could be given with a yearly report and added that it was standard to monitor three years straight with quarterly tests done on the same or as close to the same date possible. He also said that some of the homeowners who had authorized testing of their domestic wells may drop off after the first year, but others may want to be added as they learn more about the program and have an interest in protecting water quality. Jim stated that funding for 15 to 20 years would be optimal and that several working groups had made recommendations for checking status of progress at five or ten years. Gary thought 20 years would be great as groundwater changes can be slow. Jim asked Gary if he could estimate the cost based on his experience. Gary thought tests would be about \$40 and stated that at the peak of his regional and localized monitoring in Idaho the cost was approximately \$350,000 per year for testing. Gary agreed to put some numbers together for the group of quarterly and annual costs from the work he had done (spreadsheets of examples – not a bid). Vern added that Matt Bachmann had provided him with information from USGS. He also

pointed out that since the initial research on the wells was done, some of the larger costs were out of the way and the larger expense going forward would be the cost of labor if those testing would have to travel. Vern stated that in the future it would be his preference for personnel in this area to test to reduce costs. However, he recognized the credibility, professionalism and scientific recognition USGS has which would be an asset. Another member reminded the group that the USGS can't contribute funding for gathering data but can provide funding for analyzing data. A member suggested that responsibilities could be split – testing with a local group and analysis and summaries provided by USGS. Vern thought local people could be trained and confirmed with Laurie that the South Yakima Conservation District (SYCD) could do the testing if a QAPP was in place.

Gary recommended that the group also consider money to implement testing the effectiveness of BMPs. Jim stated that BMP monitoring was on the list of alternatives as a separate line item, but felt it would be approved by the GWAC. Another member wondered if the current dairy cluster testing could be utilized as a pilot project in the GWMA since they're currently sampling the wells they installed for BMP effectiveness on farm ground. He also pointed out that in the long run this would save the group money as well. Vern thought the group could take a look at what's going on versus recommended actions and if they don't match look at it as a supplement. The member went on to say that dairy cluster soil testing had shown benefits but water monitoring was not showing any trends yet. Gary stated that he might have spreadsheets on monitoring BMP effectiveness. Vern said the group would need to find volunteers for BMP effectiveness testing but thought that perhaps incentives could pay for changes (e.g., rill to another kind of irrigation in exchange for permission to monitor) which would benefit everyone.

The group discussed who else could do the monitoring. Concern was voiced by several members when it was suggested that agencies that had regulatory oversight could perform the work. Members stated it may cause people to be slightly more proprietary because of concern that the information could be manipulated. Vern asked what the group thought about the Yakima Health District (YHD) doing the sampling adding that they had done the nitrate testing. A member stated he liked keeping regulatory entities separate from sampling and wondered if YHD was a regulatory authority. Vern pointed out that there would be clearly defined methods of analysis for data collecting so that everyone would know what would be done with the data and added that there is some interest among the County Commissioners to move YHD in that direction. Jim wanted to know if SYCD had enough people to do this monitoring if they were funded to do it. Laurie said yes she has trained staff. Dan added that farmers perceive SYCD as "helpful people." The group also discussed the QAPP requirements. Vern stated that the QAPP for the monitoring program had mostly been written. A member stated that they would like Ecology or Ag to review it. Vern indicated that he had merged QAPPs from PGG and USGS following EPA standards. Vern wanted the QAPP to pass muster with EPA, Ag and Ecology. Another member pointed out that the funding agency will have their own QAPP requirements. . In conclusion, Vern noted that if Yakima County were the lead agency they could be a clearing house for funding like they did with USGS and SYCD and coordinate their functions. He also thought it was important to find agencies that people trusted to do the work.

A member pointed out that everyone would need to recognize some fields already have a nitrogen load. Another member agreed that there is a huge denial of legacy nitrogen. A member indicated that he had been taking deep soil samples because of what he learned through his participation in

the GWAC. Vern said there were high numbers in the deep soil samples too but no one knows how long it's been there because of all of the variables. Vern added that the answer is to test soils, consider the organics, know what you need to put on and watch the water you use. Another member added that water can't be watched with rill irrigation. Vern agreed and said it would be important for the group to finish with a meaningful piece of work that included ongoing monitoring efforts to verify things are working because of the legacy issue.

A member added that he recently purchased a field that had been planted in asparagus and corn with no manure application. Because of his participation in the GWMA he soil tested at 1, 2, 3, 4 and 5 feet and found increasing levels of nitrates. As a result he changed the crop and the type of irrigation. His concern was that irrigated agriculture was missing the GWMA discussions because they are afraid of some members of the GWAC and their attitudes. Another member agreed that to entice people the group must have a different attitude. He added that the dairymen were at the table and as a result were already applying the things they had learned. Vern agreed that the message needed to get out to the farming community. Vern said that Doug Simpson said the farming community does attend grower meetings. Laurie said that SYCD is trying to piggyback on these groups but there needs to be a bigger venue. Another member said most grower meetings are focused on fruit and other crops need to be addressed as well.

Ongoing Efforts of Lead Entity: Vern stated that there needs to continue to be a lead entity and that someone had suggested an oversight or advisory committee as well. Jim added that if the County was considered the lead entity there would be authority under a State statute to do this. He added that any tangential group would not have this same authority and would need to be advisory. Vern said there seemed to be a consensus for Yakima County to be the lead entity and Rand is agreeable as long as there are resources available. Jim asked Vern if he had an estimate of the cost if Yakima County took on the role of lead entity. Vern said they couldn't estimate costs until a scope of the work had been completed. If the role was to pass out money the cost would be small. If it's to stay engaged and have quarterly meetings with accountability then the cost would be greater. Jim also wanted to know the costs of the educational component if it is housed in the County. Vern said that most likely this work would be subbed out. Jim wanted to know if this would be a minimum of one FTE. Vern didn't think it would require that but if it was a GWAC-like process it could be \$75,000-100,000 per year for salary and benefits plus an operating budget. A member stated that said he liked the thought of Yakima County being an overall manager and subcontracting out what was not their expertise. He did see GIS services as essential.

Yakima Health District Onsite Sewage System Operation and Maintenance (O & M) Plan: The RCIM Working Group has recommended that YHD be funded to write the O&M plan per the WAC. Jim indicated that the O & M plan could be nitrate specific. A member wondered why this required funding. Jim stated that YHD was not currently funded to do the plan. A member wondered what the funding needs were and stated he would be willing to recommend \$50-100,000 to kick start the plan. Additionally, he was unsure why the group needed to make a recommendation to write a plan as that was merely directing them to follow the law. Another member added that if the board of the YHD made it their priority it would get done. Jim agreed to ask David Cole how much it would cost to do this. Jim added as an FYI that no other County in eastern Washington has put together a plan and that twelve counties bordering the Puget Sound were required to do it in a year but other counties weren't given a time frame. Another member

stated that the WAC said they were to educate and while YHD had a lot of educational brochures and informative videos he wasn't aware of any outreach efforts.

Funding of Other Likely Potential Recommendations: Vern indicated that he thought financial resources for education and incentives for irrigation and nutrient management and rill irrigation transitioned to drip, pivot, etc., would also be likely recommendations. Laurie said that SYCD would be able to piggy back and share costs with other agencies which could reduce funding needs. Jim stated that more education to the right audience is a positive asset and underfunded. Another member added that if people recognize the benefits to for themselves then they would welcome education.

The meeting adjourned at 7:09 PM.

Resources Requested

Recommendations for GWAC

Deliverables/Products Status

Proposed Next Steps

- 1) Gary Bahr agreed to put some numbers together for the group of quarterly and annual costs analysis, sampling and review of data for well testing from the work he had done (spreadsheets of examples – not a bid).
- 2) Jim agreed to ask David Cole how much it would cost for YHD to prepare a Onsite Sewage System Operation and Maintenance (O & M) Plan in accordance with WAC.

Funding Work Group

Charge from Groundwater Management Area Advisory Committee

Working Group Members

Vern Redifer (Chair); Bud Rogers; Dan DeGroot; David Bowen; Ginny Prest; Jason Sheehan; Jim Davenport; Laurie Crowe; Matt Bachmann; Rand Elliott; Rick Dinicola; Steve George; Stuart Turner.

Meetings/Calls Dates

Meeting: Wednesday, September 13, 2017, 5:00-7:30 PM
Call Number: 360 407 4780 PIN CODE: 306589#

Participants

Present: Vern Redifer (Chair); Jim Davenport; Laurie Crowe; Bud Rogers; Steve George; Mark Peterschmidt and Bobbie Brady (Yakima County Support Services).

Key Discussion Points

Vern began the meeting at 5:08 PM and explained the goal was to discuss who would carry out those proposed alternatives that appeared to have the green light from the GWAC, the cost for each and possible financial sources. Jim added that the group had already discussed the first four items and now needed to address the next eight found at the bottom of page 1 and all of page 2.

GIS database/GWMA Website. A member asked if the cost of keeping the GIS data base and website current was included in the cost of Yakima County acting as lead agency. Vern indicated that the the website could be hosted anywhere by anyone.

Jim asked Vern to explain funding options. Vern said funding appropriations could come to the County as the lead entity and be disbursed to other entities through contracts. Vern added that typically legislative funding would be given to a state agency similar to the three initial appropriations made to Ecology for the LYV GWMA. The only downside is that Yakima County has to spend their own money and then get reimbursed – funds are not provided up front. Vern added that if WSU had a GWMA assignment they could get the money from the State directly as they are a state agency. A member asked if anyone else had been suggested to be lead agency. Vern said no - he knew Ecology would if there were no other alternatives. However, several members thought it was important to keep the leadership local. Jim noted that a central entity would provide the capability to have a clearing house. Vern agreed and thought it would help prevent duplicative efforts too but reminded everyone that ultimately the Commissioners would need to approve Yakima County acting as the lead entity.

Jim asked if the work of administration and GIS and GWMA website updates would equal one full-time employee. Vern thought it would depend on what Yakima County would be required to administer. A member thought that to start with it would be important to limit the endeavor to one full time-employee to see what could be accomplished and to keep from overloading the

County. He also understood that the work might be broken up between several different people. The member believed responsibilities could include coordinating data and quarterly meetings with a possible advisory committee. Vern stated that if County personnel were required to analyze data it would require another level of employment. When asked to cost it out Vern estimated a salary and benefits package at \$80,000.00, but added that \$100,000.00 might be more appropriate considering space charge, car mileage and other costs incurred beyond a salary and benefit package. Vern reiterated that it might not be necessary to add a full-time job as numerous County employees are fractionally funded. A member asked if the County currently had the necessary staff. Vern thought the County would probably need to hire someone.

Three educational campaigns –agricultural producer, urban and hobby, and health risk. Jim asked who would be the logical entities to handle each of these. A member thought that either SYCD and/or WSU could handle the agricultural producer, urban and hobby education. Vern agreed and thought that health education should be given to the Yakima Health District. He believed it was important to use local groups as they would have greater success reaching out to people they were already familiar with. A member was concerned that if the education efforts were funded separately from the lead entity it would be difficult to coordinate communication. Vern said the group could consider two models: 1) money channeled through the lead agency who would then contract with local groups enabling them to hold these groups accountable; or, 2) the groups could rely on their professional relationships. A member thought that any entity should plan to attend quarterly meetings and provide a report. Jim asked which model the legislature might respond to better. A member thought it was important not to let the requests for funding look like competition. Vern agreed and stated that if all financial requests were in the program it would strengthen the request considering the diversity of interests pulling for the same program.

Jim asked Laurie to estimate the financial need if SYCD took on the agricultural, urban and hobby portion of the education. Laurie estimated one FTE would be \$100,000 (including salary, benefits and ancillary costs) plus hardware – approximately \$10,000 (to do soil sampling demonstrations, etc.). Vern asked what sort of qualifications would be necessary. Laurie stated she would need a resource technician.

A member inquired if a full time engineer was needed at SYCD as there had been a discussion about this at the previous GWAC meeting. Laurie explained that currently four conservation districts share a “cluster” engineer funded through a grant. The member wondered if that structure was adequate to meet the engineering needs in the GWMA. Laurie didn’t believe that there was a need for a full-time engineer. She explained that an engineer was only used if someone was building a storage pond for instance. Laurie thought that funding a technician would be more cost effective.

Vern asked Laurie to give some thought to what kind of program she would put together considering the potential alternatives discussed and approved at GWAC meetings, what would it include, and what would it cost. For example, a deep soil sampling program (which would require purchasing a geo probe because as both Laurie and Vern agreed it would be less expensive than hiring someone else). Vern asked Laurie if she could complete this task by the time the next Funding Working Group met and suggested she go through the green alternative list. Laurie agreed.

A member estimated that between SYCD and Yakima County Lead Agency costs the annual funding would be \$250,000.

Engineering study - Jim stated that this would be a Public Services project but costs needed to be estimated. Vern said that County engineering studies had been funded through Community Development Block Grants which are limited to about \$30,000.00 per grant. Vern thought there were probably four areas in the GWMA requiring study but noted that the standard in these types of situations would be to look for a way to provide clean water first and then examine ways to fix the problem. He added that engineering studies usually advance engineering solutions to solve problems. He thought that the State Department of Commerce might fund Community Development Block Grants and said the County can also make an application every three years for a \$750,000 construction Community Development Block Grant.

Building from the WSDA's Nitrogen Availability Assessment - a member wanted to know where the language for "hire a technical consultant to conduct a literature review" came from. Jim said it was a compilation of alternatives that had been coded green. The member wanted to make decisions from data collected and was not interested in decision making from literature reviews. Jim thought that was a problem since most of the locally collected data for the NAA had been disputed causing the WSDA to refer back to literature review. Vern stated that Gary Bahr had put a lot of effort into thinking about this and Gary recommend collecting more data locally because it was more meaningful than literature review. The group agreed to take the sentence out for the purposes of the Funding Group discussion so that they might ascertain funding for WSDA to accomplish this alternative.

Vern and Laurie agreed that the data collections from deep soil samples would be the most beneficial. A member went on to ask if the sampling data needed to be collected every year or if it could be done every few years. Jim will talk to Gary Bahr and have him summarize his recommendations, estimate the frequency of each recommendation and the cost of each. Preliminarily the group agreed to an estimate of \$25,000. Vern said the real figure should include: what data is needed, how and when it will be collected and what it is going to cost. He added that the cost to plug the information in to the NAA will be less since all of that work has already been done.

Jim asked the group if he should continue to put together alternatives for the group to put prices to. The group agreed this would be profitable. Vern noted that Yakima Health District was looking at and was interested in doing the well monitoring. Vern thought this was good as a local group would cost less than bringing someone in from out of the area.

The meeting adjourned at 6:30 PM.

Resources Requested

Recommendations for GWAC

Deliverables/Products Status

Proposed Next Steps

Laurie Crowe will consider potential GWAC approved alternatives, put together a program, cost it out and report at the next Funding group meeting.

Jim will talk to Gary Bahr (WSDA) about the NAA and have him summarize his recommendations and estimate the cost and frequency of each.

Attachment B

List 2.1_Work Group alternatives with WG recommendations 6-22-17-Final Vern
(the original alternatives' list presented to the GWAC).

Copy of the GWMA Survey Report after GWAC 9.21.17 (GWAC's September 21
version).

Alternative land and water use management strategies for reaching program goals and objectives per WAC 173-100-100(4)			Evaluation Criteria per WAC 173-100-100 (4)						
Ref. #	Action	Proposed by	Feasibility	Effectiveness	Cost	Proposed funding	Time	Difficulty to implement	Degree of consistency with local comprehensive plans and water management programs
Remediation									
1	Pump, treat and reinject groundwater	WGD	not feasible, treatment area too large	not effective because of 3-dimensional size of treatment area	excessive				
2	Pump-and-fertilize. Use existing (or new) agricultural water wells to remove nitrate-contaminated groundwater and "treat" the water by using it to irrigate crops which will take up the nitrogen concentration in the irrigation water (presumes the existence of a proper nutrient management plan for the irrigated acreage).	Literature							
3	Fill irrigation ditches with water and let it sit there to leak into groundwater. Use groundwater recharge as a means to dilute nitrate concentrations in the groundwater.	WGD						irrigation district canal maintenance in winter, increased personnel?, irrigation district compensation, relation to water rights? problem of freezing of flow meters in laterals, interaction with Bureau of Reclamation	
4	Drill new 1,500 foot wells to replace contaminated wells .	WGD			\$12 million				
5	Regionalize and connect users to a larger system with reliable quality water.—pipe connection to an existing system	WGD							
6	Blend better quality water with contaminated water to reduce nitrate concentrations	Literature	works for larger community systems with more than one water source.						
7	Construct a potable water line from nearby developed area into deadhead water stations at central rural location (permit potable water collection at deadhead water stations).	Literature							
8	Discontinue use of shallow wells. Rebuild, repair or replace poorly constructed wells.	WGD							
9	Remediate local nitrate contamination hotspots only .	Literature							
Administration/Lead Agency									
10	Identify or create an organization (Lead Entity) responsible for implementation and oversight of the LYV GWMA Groundwater Management Plan and acquisition of stable funding to support their activities. Potential entities include, Yakima County, South Yakima Conservation District (SYCD), Yakima County Health District, Washington State Department of Agriculture (WSDA), Ecology, and/or a yet to be formed entity.	L/C WG							
11	Implement an Adaptive Management Plan utilizing data collected, progress made, or lack of progress to inform the community on adjustments that need to be implemented. Plan could incorporate availability of technology, education and outreach, tracking exports, land use regulations, treatment systems, and other changes to inform decision makers regarding management changes necessary for a successful program.	L/C WG							
12	Let the lead agency determine who will do monitoring. Possible assignment of long-term monitoring after 2017 to Yakima Health District.	WGD							
13	Inform livestock operators and facilitate a dialogue with representatives of the regulatory agencies, other agricultural producers, and the general public through a public information/education program to protect the quality of the area groundwater resource. Information and incentives provided to Lower Yakima Valley agricultural operators will expedite implementation of BMPs.	L/C WG							
14	Collect, analyze, and interpret data to track water quality improvement progress, nutrients generated, applied, or exported, which will inform the implementation of an Adaptive Management Plan within the LYV GWMA.	L/C WG							

Alternative land and water use management strategies for reaching program goals and objectives per WAC 173-100-100(4)			Evaluation Criteria per WAC 173-100-100 (4)						
Ref. #	Action	Proposed by	Feasibility	Effectiveness	Cost	Proposed funding	Time	Difficulty to implement	Degree of consistency with local comprehensive plans and water management programs
15	Focus implementation of analyzed data based on information and data included in the Nitrogen Loading Assessment, Soil Sampling Program, Ambient Groundwater Monitoring Plan, USGS Reports, and other similar scientifically based publications.	L/C WG							
16	Increase education and outreach efforts by improving the availability of technical assistance to develop nutrient management plans for all livestock industries. Assist industry trade organizations to enhance their local efforts to bring information to their members. Help increase livestock operator awareness of the need for procedures for proper management of animal wastes and wastewater. Potential funding sources include industry, government, educational institutions, grants, industry associations, etc...	L/C WG							
17	Cooperate with the WCC and WSDA in their efforts to document regulatory compliance for dairies within the GWMA that are completing and implementing Dairy Nutrient Management Plans (DNMP). Explore the possibility of disclosing non-proprietary data produced through the DNMP process.	L/C WG							
18	Further develop a local forum for disseminating information and facilitating technical exchange regarding BMPs for livestock management and groundwater protection. Endorse and distribute materials by all effective means that will educate the public about the facts of livestock waste management and the science of groundwater protection.	L/C WG							
19	Quantify the nutrient value and rate of release of nitrate from livestock waste under various Lower Yakima Valley conditions to become part of the nutrient management guidelines.	L/C WG							
20	Voluntary development and implementation of NMPs by operations not already required to hold permits or a DNMP as an effective means of environmental protection.	L/C WG							
21	Allocate cost share funding or other funding assistance to operators implementing environmental protection measures.	L/C WG							
22	Develop strategies for marketing the economic, fertilizer value, and soil enhancing properties of appropriate application of manure and other livestock wastes.	L/C WG							
23	Provide Yakima County fiscal support to maintain its GIS data base on the GWMA over time.	Literature							
24	Overlay GIS density maps reflecting different sources of nitrogen in order to geographically indicate the total density from all sources.	Literature							
25	Map those areas that can tolerate more nitrogen application and areas that are more vulnerable to its application.	Literature							
26	Use USGS particle tracking model to indicate where groundwater moves faster (permeability).	WGD							
27	Assess groundwater contamination potential, making use of the available information on soils, geology, and groundwater in order to identify those areas that are the most vulnerable to contamination. These areas may be closer to surface water, areas where recharge is faster or more frequent, or areas where shallow soils overlie soluble bedrock. Identify strategies "upstream" of sensitive areas to reduce contributions of nitrate sources.	WGD							
28	Enact County ordinances that would affect the problem grower.	WGD						Difficult to enforce.	
29	Maintain the County's GWMA website.	WGD							
30	Create an aquifer protection area.	WGD	Requires vote of people within protection area		Generates tax revenue				
31	Consider the enactment of a county ordinance addressing the density of segments of nitrate producing agricultural activity within the areas currently zoned as agricultural within the GWMA.	WGD		Prospective application					
32	Consider creation of subcategories of agricultural zoning, limiting density in those areas where soils are more permeable or groundwater moves faster.	WGD		Prospective application					

Alternative land and water use management strategies for reaching program goals and objectives per WAC 173-100-100(4)			Evaluation Criteria per WAC 173-100-100 (4)						
Ref. #	Action	Proposed by	Feasibility	Effectiveness	Cost	Proposed funding	Time	Difficulty to implement	Degree of consistency with local comprehensive plans and water management programs
33	Consider “overlay” zoning ordinance adding special groundwater conservancy restrictions to otherwise conventionally zoned properties. Uses consumptive of groundwater quality resources are precluded or more generally regulated. Uses that are not consumptive of groundwater quality resource are permitted. Specific limitations might include limitations of water use, drainage, development density, septic use.	Literature		Prospective application					
34	Define “conditional uses” that can be allowed after assurance that groundwater resources would not be damaged.	Literature		Prospective application					
35	Consider a county ordinance concerning overapplication of manure.	WGD		Prospective application				Difficult to enforce	
36	Create county ordinance limiting total number or density of cows or dairies (lid).	WGD		Prospective application				Difficult to enforce	
37	Adopt a LYC GWMA or county-wide CAFO ordinance	L/C WG (no consensus in WG)	Lengthy public process to create a CAFO Ordinance. Uncertain outcomes and timing. Too much uncertainty to rely on this option for the plan at this time. The county might consider legislative action as an alternative if public outreach, voluntary compliance, implementation of identified BMP’s, and other efforts are not effective.						
38									
39	Establish a quota system through zoning regulations establishing how much nitrogen could be applied (based on agronomic rates for individual crop types) within fixed zones.	WGD		Prospective application				Difficult to enforce	
40	Consider density limitations, building codes for farm structures, development standards for farm activities.	WGD		Prospective application					
41	Regulate crop mix to weight more toward nitrogen-light crops--	Literature						Difficult to enforce	
42	Consider limitation of septic systems (therefore building permit) where soil filtration rate is high, where housing density is already big, where nitrate concentration is already great downstream of the septic plume	Literature	Applied administratively, requires GIS mapping of soil zones					Growers view as governmental interference with economic choice if nitrogen-heavy crops generate better returns	
43	Property tax for properties with onsite septic systems, waived in the case of proper inspection and pumping	Literature							
44	Protect Critical Aquifer Recharge Areas	WGD							
45	Require bonding as prerequisite to permitting of livestock operations so as to assure financial capability for clean up in the instance of bankruptcy or other economic failure.	GWACD							
46	Measure the effects of GWAC program on Yakima County economics.	WGD							
47	Establish a more interactive and frequent relationship between Yakima County and NRCS.	WGD							
Education									
48	Develop post GWAC education and outreach campaign	EPO							
49	Broaden the pool of people GWMA is educating or communicating with.	EPO							
50	Maintain a public education program regarding nitrate pollution and health risk over a 5-10 year period. Provide all materials distributed to the public in English and Spanish.	EPO							
51	Billboard campaign – urging well testing	EPO							

Alternative land and water use management strategies for reaching program goals and objectives per WAC 173-100-100(4)			Evaluation Criteria per WAC 173-100-100 (4)						
Ref. #	Action	Proposed by	Feasibility	Effectiveness	Cost	Proposed funding	Time	Difficulty to implement	Degree of consistency with local comprehensive plans and water management programs
52	Create 1 FTE Bilingual Outreach Coordinator Position to implement a post-adoption outreach campaign (EPO meeting summary 8/1/2014 & proposed to GWAC 8/21/14 - voted low priority)	EPO	Low	Unknown	\$83,000 annually		1 FTE	Requires clear, measurable outcomes[1], a “home” agency to house, provide oversight, and to measure effectiveness; and ongoing funding.	
53	Develop a K-12 education program about groundwater and best management practices--mobile program visiting schools.	EPO							
54	Employ/enlist college students to conduct surveys, consider outreach methodologies as part of classwork to assist with GWMA education	EPO							
55	Educate the public, particularly in towns, about lawn and garden nitrogen applications' contribution to nitrate concentrations	EPO							
56	Educate private well owners: Re: protect your family; know who’s at risk; test your well regularly.	EPO							
57	Private well owners’ responsibility to protect WQ	EPO							
58	Publish public information about proper septic system construction and operation	EPO							
59	Advise the public that GWMA is looking for abandoned wells. Wellhead protection education	EPO							
60	Offer incentives for property owners to identify and properly abandon wells.	EPO							
61	Offer incentives to drill deeper wells for homeowners served by shallow, poorly constructed, poorly located wells.	EPO							
62	Offer incentives to connect households on private wells near community water systems to connect to a community water system. (Nitrate Treatment Pilot Program-June 2011)	EPO							
63	Provide a resource hotline (as proposed by RCIM on 8/2014)	EPO							
64	Prepare a fact sheet/develop outreach campaign to growers that explains agronomic rates – applying nutrients at the right time/right place/right amount	EPO							
65	Study report outreach: Show/Identify how much nitrogen is left after nutrient uptake in crops.	EPO							
66	Encourage commodity groups to provide education on water management and fertilizer use through regular meetings.	EPO							
67	Outreach targeted to small farm/hobby farm/rachettes manure management	EPO							
68	Educate irrigation users on the consequences of too much irrigation.	EPO							
69	Inform farmers about technological improvements in irrigation that permit easier management of water, descriptions of specific improved technology, and economic viability of technological advancements .	EPO							
70	Enlist advocacy groups/Farm Bureau/federations/associations to host workshops/informational meetings regarding GWMA education goals and partnerships in success	EPO							
71	Make presentations at trade shows, communicate with agricultural consultants who have positive relationships with farmers suggesting that they change practices	EPO							
72	Partner with UW Pediatric Environmental Health Specialty Unit (PEHSU) to continue training local healthcare providers to recognize and address Nitrate risk in their patients (pregnant women and infants up to six months)	EPO	Feasible	Effective	Up to \$30,000 annually (.25 FTE; + translation, printing, coordination)	Unknown	.25 FTE	Coordinate partnership through either DOH or YHD	
73	Advise the public that GWMA is looking for abandoned wells	WGD							
74	Encourage commodity groups to provide education on water management and fertilizer use through regular meetings	WGD							
75	Inform the public about the health risks related to nitrates in drinking water	J Mendoza							
76	Provide education about concepts that people must understand in order to evaluate our plans for reducing nitrate in groundwater.	J Mendoza							

Alternative land and water use management strategies for reaching program goals and objectives per WAC 173-100-100(4)			Evaluation Criteria per WAC 173-100-100 (4)						
Ref. #	Action	Proposed by	Feasibility	Effectiveness	Cost	Proposed funding	Time	Difficulty to implement	Degree of consistency with local comprehensive plans and water management programs
Research and Data Collection									
77	Use both method-based measurement and performance-based measurement.	WGD							
78	Establish performance objectives against which monitoring data can be compared--number of at risk wells, BMP implementation, funding success, reduction in number of underperforming farming practices	Literature							
79	Implement Ambient Groundwater Monitoring Plan	GWAC	Feasible						
80	Implement Drinking Water Quality Monitoring Plan	GWAC	Feasible						
81	Establish a fund and plan to analyze data collected in ambient water quality monitoring and drinking water well monitoring programs. Study short-term seasonal variations in nitrate concentrations over next year or two--addresses how changes in nutrient application over the agricultural cycle affects things. Study long-term trends that develop over several years--to track whether the overall picture is getting better, whether changes recommended by GWMA are having impact.	WGD							
82	Use hydro-geologically directed monitoring well placement to detect cause/effect remediation opportunities.	Literature							
83	Building from the WSDA's Nitrogen Availability Assessment, develop a Nitrogen Loading Assessment for all agricultural, residential and commercial properties, using newly collected data. Hire a technical consultant to conduct a literature review to determine the most relevant information and accurate factors for use in the Nitrogen Loading Assessment. Periodically repeat the grower survey used in the Nitrogen Availability Assessment to compare against the currently established data. Collect data on how many acres in the GWMA are fertilized in various crops with manure and how many with commercial fertilizer. Update and monitor the percentage of acreage in various crops, particularly silage corn and field corn. Study effect of contribution of nitrogen from cover crops used to form mulch. Determine acreage for triticale. Discover commercial fertilizer tonnage for Yakima County and/or for GWMA. Explore how much nitrogen leaches into groundwater from drains and wasteways. Study atmospheric deposition more comprehensively. Understand the difference between plant uptake and plant removal of nitrogen.	WGD, Literature							
84	Get fertilizer loading numbers per crop type. Get economic engine factors per crop type. Determine crop/fertilizer utility ratios. Consider economic benefit of various crop type categories. Consider agricultural usage categories (e.g., field crop, row crop, vineyard, orchard, dairy. Determine amount of land appropriate for each, and location best for each given soil, climate, effect upon groundwater, etc. Ensure adequate supply of each in order to permit opportunity of market choice.	Literature							
85	Recommend that the Yakima Health District or Yakima County continue the High Risk Well Assessment (survey to identify outreach messaging related to health risks and well sampling) periodically over a 5-10 year period. Collect more information on wells known to have high nitrate concentrations, perhaps identifying whether the concentration is self-caused	WGD							
86	Conduct recurrent drinking water testing where drinking water standards have previously been exceeded.	Literature							
87	Design and implement pilot studies focusing on innovative farm techniques which reduce nitrogen loading to crops and monitor results for future expansion of findings.	Literature							
88	Explore whether nitrate leaching is greater with vetch amended soil or commercial fertilizer amended soil. The results of one study indicate that vetch nitrogen, in comparison to fertilizer nitrogen, leads to lower concentrations of soil inorganic nitrogen and greater immobilization of added nitrogen in soil organic matter. This would reduce the potential for nitrate leaching.	Literature							

Alternative land and water use management strategies for reaching program goals and objectives per WAC 173-100-100(4)			Evaluation Criteria per WAC 173-100-100 (4)						
Ref. #	Action	Proposed by	Feasibility	Effectiveness	Cost	Proposed funding	Time	Difficulty to implement	Degree of consistency with local comprehensive plans and water management programs
89	Recommend that WSU Extension Service update Appendices A and B of the Washington Irrigation Guide.	WGD							
90	Recommend that Western Fertilizer Handbook, Western Plant Health Association, Ninth Edition (2002) be updated.	WGD							
91	Fund professional adaptation of Utah Fertilizer Guide for Washington State http://extension.usu.edu/files/publications/publication/AG_431.pdf	Literature							
Washington State Department of Agriculture									
92	Develop Nitrogen Loading Assessment as provided in Research and Data Collection above.	WGD							
93	Summarize the DNMP reporting and provide information that would disclose the amount of manure the CAFO's in the GWMA created and where it was distributed.	WGD							
94	Review and evaluate the WSDA Dairy Nutrient Management Program inspection protocols to assist in determining if additional resources should be allocated and identify any areas for improvement of the inspections themselves.	L/C WG							
95	Add staff to WSDA to oversee Dairy Nutrient Management Plans and complaints regarding manure spills.	WGD							
96	Promote on-going research for managing animal nutrients.	WGD							
Southern Yakima Conservation District									
97	Ask SYCD for projected plan to expand fiscal and administrative capacity	Literature							
98	Fund post GWMA education and outreach through Conservation District	WGD							
99	Put request for \$\$\$ for SYCD in State Conservation Commission budget	WGD							
100	Enhance engineering expertise (personnel) within Conservation District--none there or at NRCS	WGD							
101	Charge dairies for Conservation District preparation of Dairy Nutrient Management Plans	WGD							
102	Recommend funding for Southern Yakima Conservation District review of Dairy Nutrient Management Plans	WGD							
103	Provide better funding and more staffing for Conservation District: hard money funding, increase property tax assessment, create exceptions to taxation for demonstrated testing and monitoring.	WGD							
104	Develop water sorption graph or chart. List volumes of water applied, soil types, absorption/compaction rates, depths to water, pre-season and post-season appropriate moisture levels.	Literature							
US Geological Survey									
105	Use USGS Particle Tracking Model	WGD							
106	Use USGS particulate tracking model to identify targets of education	WGD							
107	USGS Particle Tracking Model Overview--potentially combined with MT3D MODFLOW application to the vadose Zone	WGD							
Yakima Health District									
108	Study potential nitrate contamination attributable to improperly operated septic systems. Consider restoration/retrofit of older septic systems through incentives or county property tax breaks.	WGD							
109	Drill deeper water wells further from septic drain systems	WGD							
110	Require builders to demonstrate that septic system design will not add to nitrogen loading problem as condition of construction	WGD							
111	Publish and distribute homeowner guide on how to use septic systems	WGD							
Department of Ecology									
112	Publish the Department of Ecology's lists of certified laboratories that can test private wells for nitrates and pathogens and Ecology's providing funding to low income, private well users, in order to conduct this testing.	WGD							
113	Encourage an increase in the number and availability of soil testing laboratories.	Literature							
114	Make grants that complement projects related to non-point source pollution.	WGD							

Alternative land and water use management strategies for reaching program goals and objectives per WAC 173-100-100(4)			Evaluation Criteria per WAC 173-100-100 (4)						
Ref. #	Action	Proposed by	Feasibility	Effectiveness	Cost	Proposed funding	Time	Difficulty to Implement	Degree of consistency with local comprehensive plans and water management programs
115	Provide grant funding for well decommissioning.	WGD							
116	Search for abandoned wells.	WGD							
117	Send a postcard to 10 % of known property owners on record having a well asking about knowledge of older wells.	WGD							
118	Compare Google Earth to Yakima County GIS images to determine building changes and thus possible well usage changes. Focus first on hotspot high density areas in GWMA. Ground truth suspected problem wells.	WGD							
119	Educate realtors and banking industry about disclosure of abandoned wells in property transfers.	WGD							
120	Educate public regarding liability of an ill-secured well.	WGD							
121	Provide some form of protection for self-reporting of abandoned or improperly decommissioned wells.	WGD							
122	Seek legislative change on requirements for well decommissioning, making them cheaper.	WGD							
123	Amend RCW 18.104.055 to dedicate a portion of "notice of intent" fees to a fund to be used by Ecology (or Health) for the proper decommissioning of wells in those cases where DOE (or Health) determines that such publicly-funded action is necessary in the public interest to protect or enhance the quality of public health ("infirmary" of the public health).	Literature							
124	Amend authority of Department of Ecology to gain access to properties where manure is spread outside land subject to nutrient management plans	WGD							
Residential, Commercial, Industrial, Municipal									
125	Encourage municipalities within the GWMA to extend municipal sewer systems within urban growth areas and retire ROSS and LOSS.	RCIM WG							
126	Encourage connection of residences within urban growth zones to sewer systems extended by municipalities.	RCIM WG							
127	Encourage the development of group septage-management or treatment systems in areas outside urban growth zones where the density of residential development could exacerbate the effect of multiple OSS on groundwater quality.	RCIM WG							
128	Establish or maintain ongoing, extended funding necessary for the Yakima County Department of Public Services and Yakima Health District to actively participate in water quality improvement, testing, monitoring, scientific data analysis, and infrastructure development.	RCIM WG							
129	Request Yakima County Public Services to perform an engineering study of locations outside urban growth areas where there is rural residential medium to high density OSS and the nitrate concentration is greater than the state water quality standard where community water systems could feasibly be constructed in lieu of individual water wells.	RCIM WG							
130	Request Yakima County Public Services to perform an engineering study of locations outside urban growth areas where there is rural residential medium to high density OSS and the nitrate concentration is greater than the state water quality standard where community waste water systems could feasibly be constructed in lieu of individual on-site septic systems.	RCIM WG							
131	Request that the Yakima Health District prepare a plan, as required and described by WAC 246-272A-0015, giving primary emphasis on educational programs for operation and maintenance of existing on-site septic systems (OSS), reserving a determination regarding the advisability of the establishment of regulatory or enforcement programs until data is available from the GWMA's monitoring well system.	RCIM WG							

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Ref. #	Action	Proposed by	Feasibility	Effectiveness	Cost	Proposed funding	Time	Difficulty to implement	Degree of consistency with local comprehensive plans and water management programs
132	Request the Yakima Health District to consider the nitrate density element when approving proposed septic systems, including those technologies verified by the U.S. EPA's Environmental Technology Verification Program, for reducing the nutrient nitrogen in domestic wastewater discharged from OSS, including fixed film trickling filter biological treatment, media filter biological treatment, and submerged attached-growth biological treatment.	RCIM WG							
133	Recommend that soil testing be performed below at least two ROSS drain fields (one with a shallow water table, one with a deeper water table) in high density areas to analyze nitrogen loads as the septage approaches the water table.	RCIM WG							
134	Request that the State Department of Health determine, prior to issuing or reissuing LOSS permits, that all employee counts are regularly reported, so that the LOSS will continue to operate as designed.	RCIM WG							
135	Recommend that the State Department of Health consider not approving additional LOSS or otherwise require an effective nitrate removal system.	RCIM WG							
136	Request that the Department of Ecology analyze the trends of nitrate data contained within reports required by NPDES and SDWA permits.	RCIM WG							
137	Educate the public regarding the importance of the integrity of wells, particularly those without a well log, and fund and encourage periodic well inspection by the Yakima Health District or professional well engineers.	RCIM WG							
138	Require that site inspections for possible abandoned wells be performed before building permits are issued for properties that are proposed to be redeveloped after prior development of domestic, agricultural or industrial uses.	RCIM WG							
139	Request that the Department of Ecology develop a plan for finding and decommissioning abandoned wells in the next 12 months, using the LYVGWMA as a pilot project.	RCIM WG							
140	Permit the repair or decommissioning of wells by general contractors, rather than exclusively by well-drillers, so as to diminish costs of decommissioning.	RCIM WG							
141	Assist hobby farmers to locate ROSS drain fields on their property so as to avoid animal farming over the drain field.	RCIM WG							
142	Request the county include the EPO flyer on OSS maintenance in correspondence with GWMA home owners for 5 years. i.e. tax bills, property transfers.	RCIM WG							
143	Make facility process improvements in waste treatment and food processing plants to reduce nitrogen and total discharge volume.	Literature							
144	Replace aging sewer system infrastructure and ensure proper system maintenance to reduce nitrate leaching.	Literature							
145	Require new developments to address impacts on groundwater quality through permitting review of "site plan review criteria."	Literature							
Technology									
146	Identify and support opportunities, including educational research institutions, for private, public, and industry investment in technology specific to addressing nitrate contamination in groundwater.	L/C WG							
147	AKART—industry can't keep up with technology, required if performance already meets performance standards?	WGD							
148	AKART problems--does standard mandate installation of new technologies even when existing ones accomplish the measured objective	WGD							

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Ref. #	Action	Proposed by	Feasibility	Effectiveness	Cost	Proposed funding	Time	Difficulty to implement	Degree of consistency with local comprehensive plans and water management programs
149	Require nitrogen reducing technologies for onsite septic systems:	WGD			estimated installation costs \$20,000, yearly operational costs about \$1,500, recirculating sand filters, carbon systems, old system retrofits cost \$5,000-7,000 per system				
150	Explore public investment in waste to energy technology	WGD							
151	Promote new products that are found through research	WGD							
152	Promote markets for those products	WGD							
153	Use commodity group "check off" money for research and development	WGD							
BMPs									
154	Inform farmers of those BMPs prioritized by Livestock/CAFO and Irrigated Agriculture Work Groups from HDR list to reflect greatest effectiveness in nitrate reduction	WGD							
155	Determine who implements the BMP and who monitors it and the time frame in which to measure/monitor it--problem with available expertise, timing, installation cost	WGD							
156	Identify and publish a list of poor management practices. Recommend that they be terminated or avoided.	Literature							
157	Establish a BMP monitoring well network. Monitor BMP performance and effectiveness with the monitoring well network first, then monitor water quality.	Bowen: Having a monitoring plan for the BMP's in place is part of the work the GWAC is required to do.							
Livestock									
158	Recommend that dairies and CAFOs use those Best Management Practices contained within Attachment B to the Livestock/CAFO Work Group's Report to GWAC	L/C WG	Feasible	GWAC has not reached consensus that pursuing this recommendation alone would accomplish Goals # 1, 2.					
159	Encourage the WSDA and Conservation Districts to continue education and outreach to livestock operators about impacts and practices related to compliance with relevant State and federal requirements for groundwater protection, particularly addressing those not currently acting in good faith toward that objective.	L/C WG	Feasibility depends upon available resources		2 additional FTE's cost ?	Industry, government, private or public research and development, foundations, and industry associations.			
160	Implement an Education and Outreach Program (EOP) informing producers of Best Management Practices (BMP's) including increased funding for the DNMP assistance program.	L/C WG							

Alternative land and water use management strategies for reaching program goals and objectives per WAC 173-100-100(4)			Evaluation Criteria per WAC 173-100-100 (4)						
Ref. #	Action	Proposed by	Feasibility	Effectiveness	Cost	Proposed funding	Time	Difficulty to implement	Degree of consistency with local comprehensive plans and water management programs
161	Create and maintain a central depository of public information online, as part of an Education and Outreach Program (EOP) informing producers of the nitrate issue, community impacts, and Best Management Practices (BMP's).	L/C WG				Industry, government, private or public research and development, foundations, and industry associations.			
162	Increase funding for the local Conservation District and Natural Resources Conservation Service (NRCS) so that assistance programs for nutrient management planning, engineering, cost share, and loan funds are more available.	L/C WG				Industry, government, private or public research and development, foundations, and industry associations.			
163	Streamline current enforcement activities so as to improve customer service and protocols, increase clarity of process, escalate enforcement for facilities not following management practices, identify methods to discourage repeatedly unfounded complaints, and improve overall transparency.	L/C WG							
164	Collect data to track water quality improvement progress and nutrients generated, applied, or exported within the LYV GWMA. Generate data through soil testing. Ambient Groundwater Monitoring Plan implementation - including purpose built and existing wells, sampling of liquid and solid waste to be field applied, composted, or exported, the CAFO General Permit, and tracking nutrients applied by non-dairy operations.	L/C WG							
165	Support and advocate private, public, and industry investment in technology, including at research institutions, specific to addressing nitrate contamination in groundwater, especially where it creates improvements for the public good.	L/C WG							
166	Require more complete disclosure of Dairy Nutrient Management Plans.	WGD							
167	Incentivize technology and management of fertilizers and manures.	WGD							
168	Install separation systems--separate liquids from solids.	WGD							
169	Use anaerobic digestion in waste storage lagoons	WGD			Very expensive				
170	Install liners in liquid waste storage lagoons.	WGD							
171	Install impervious surfaces beneath silage/feed storage.	WGD							
172	Revise WAC 246-203-130 so that it defines "health hazard" and "nuisance" and includes specific and enforceable requirements designed to protect human health.	WGD, Literature							
173	Compost more manure	WGD							
174	Improve composting regulations	WGD							
175	Provide underlying soils information to each livestock operation so that individual evaluations can be made.	Literature							
176	Remove wastes from barnyards and other areas of animal concentrations and frequently convey them to waste storage or treatment facilities.	Literature							
177	Prevent contaminants from flowing into wells by ensuring that the external areas around well casings are properly sealed and that wastes are kept the recommended distance from wells.	Literature							
178	Entrain water (as rain or snow-melt) collected from roofs away from animal pen or manure collection facilities.	Literature							
179	Drain low areas where ponds accumulate to collect and manage waste waters.	Literature							
180	Treat manure supply in excess of that which can reasonably be applied as nutrient to agricultural lands as a "waste" product. Apply waste management strategies including land disposal at designated site, incineration, centralized waste-to-energy facility.	Literature							
181	Create a state CAFO Siting Team, composed of representatives of relevant state agencies with support from USGS, to which the county commission could refer proposed CAFO sitings or expansions. The CAFO Siting Team would provide a recommended site suitability determination, based upon a predetermined scoring system, including description of environmental risk factors and mitigation strategies.	WSDA, Gary Bahr							

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Ref. #	Action	Proposed by	Feasibility	Effectiveness	Cost	Proposed funding	Time	Difficulty to implement	Degree of consistency with local comprehensive plans and water management programs
182	Amend Dairy Nutrient Management Act to extend WSDA's authority t land application acreage with which dairy facilities contract pursuant to nutrient management plans.	Literature							
Irrigated Agriculture									
183	Anecdotal results of deep soil sampling carried out by SYCD with farmers with pre-existing relationship with SYCD were informative. Word-of-mouth reporting within farmer community greatly increased acres sampled. Establish a multi-year deep soil sampling program where farmers subscribe for a duration with pre-determined fiscal remuneration for completed sampling. Cost share with farmer. Farmer to provide checklist indicating performance with BMPs. Test throughout growing year, in order to observe effects of fertilization throughout year. Share data with public.	WGD			Expensive	Federal or State			
184	Do deep soil sampling on fields within GWMA that apply biosolids.	WGD							
185	Make shallow (1, 2, 3 foot) soil testing reports prerequisites for funding, lending or building permits.	WGD							
186	Hire soil scientists to do publicly funded "spot auditing" soil checks for feedback to farmers and fertilizer sellers.	Literature							
187	Incentivize development and provide information about improvements made in nutrient management and agronomic rate application of fertilizer by specific developing technologies	Literature							
188	Commission the creation of a data assembly software that could receive, translate, assemble and analyze the data produced by agricultural equipment technology manufactured by different agricultural equipment manufacturers, so as to permit integration of data per field, crop or enterprise.	WGD, Doug Simpson							
189	Monitor nitrate concentrations of irrigation water at headgates.	Literature							
190	Stimulate news coverage of progress in irrigation technology.	WGD							
191	Land acquisition—purchase properties with greatest nitrate contribution and retire uses that generate nitrate.	Literature							
192	Incentives—provide credit against county real property tax for investment in source abatement.	WGD							
193	Develop farmer-specific irrigation water use programs including collection of data, records of irrigation management, education of farmer regarding new processes and technology.	WGD							
194	Create irrigation management plans (similar to nutrient management plans) for farms over a minum size and provide financial assistance for implemented plans.	WGD							
195	Encourage advanced irrigation management. Recognizing that there is significant cost involved in changing an irrigation system, look for strategic opportunities in the area where the use of more advanced irrigation management systems could have the greatest benefit for reducing nitrogen impacts to groundwater. One example of advanced irrigation management is electronic sensor irrigation water management (IWM). Identify federal, state and local incentive programs, such as grants, and low interest loans, to facilitate a transition to more advanced irrigation management in those areas	EPA Region 10							
196	Provide funding for a mobile irrigation lab to assess the efficiency of current or advised irrigation practices, either through a singular lab or component parts.	WGD							
197	Provide financial assistance for 1) conversions from rill irrigation to sprinkler or drip irrigation, 2) installation of flow meters and moisture meters to reflect over-irrigation, high water table, drought conditions, 3) the cost of hiring third party sampling , measuring equipment, personnel or self-test kits, 4) management of sprinkler systems so they do not drive nutrients past the root system.	WGD							
198	Establish a voluntary irrigation management cost-share program with SYCD. Data shared with public.	WGD							
199	Manage sprinkler systems so they do not drive nutrients past the root system.	WGD							

Alternative land and water use management strategies for reaching program goals and objectives per WAC 173-100-100(4)			Evaluation Criteria per WAC 173-100-100 (4)						
Ref. #	Action	Proposed by	Feasibility	Effectiveness	Cost	Proposed funding	Time	Difficulty to implement	Degree of consistency with local comprehensive plans and water management programs
200	Advise farmers of the relative propensity of wheel lines, center pivots, and drip lines to cause leaching.	Literature							
201	Use available techniques to determine how much and when irrigation is needed instead of irrigating according to a prearranged schedule.	Literature							
202	Schedule water and nitrogen application according to the need for optimal crop yields.	Literature							
203	Analyze irrigation practices to discover whether frequency or volume creates greater propensity for leaching.	Literature							
204	Identify and decommission abandoned agricultural irrigation wells.	Literature							
205	Upgrade irrigation districts' open, earthen or concrete delivery laterals and head ditches to PVC pipe.	Literature							
206	Route irrigation-return flow through a constructed managed wetland to reduce concentrations of nutrients and suspended sediment.	Literature							
207	Add polyacrylamide (PAM) to irrigation water.	Literature							
208	Install effective backflow prevention devices on supply lines of water supplied from groundwater wells to avoid backflow from chemigation.	Literature							
209	Structure irrigation water pricing by volume per acre used with preference for lower volume use.	Literature							
210	Improve micro-irrigation system design and operation.	Literature							
211	Recommend that irrigation districts be authorized to condition delivery of irrigation water on irrigation practices consistent with agronomic rate of application of water.	WGD							
212	Require irrigated agriculture nutrient management plans. Record the source and type of fertilizer and number of acres fertilized with each.	WGD							
213	Establish water use "domains" (zones) to apply water use constraints, or well construction design constraints, for agricultural uses.	Literature							
214	Develop and implement Nutrient Management Plans (NMPs) for all producers (those that apply manure and those that apply synthetic fertilizer that include annual soil testing for phosphorus and nitrogen and which follow available guidance (i.e. Land Grant University) for developing appropriate land application rates for phosphorus and nitrogen. These NMPs can identify site specific conservation practices that are, or will be, implemented to minimize the transport of phosphorus or nitrogen to surface and ground waters. NMPs that are "adaptive" – adjusted based on annual soil tests, the types of crops grown, and other site or field specific factors – allow producers to adjust their plans and practices as new information becomes available.	EPA Region 10							
215	Provide funding for nutrient management education or information distribution.	WGD							
216	Make Nutrient Management Plan records available upon Department of Agriculture determination of potential excessive application of nutrients.	Literature							
217	Incentivize investment in crops that require less fertilization, or which take up greater amounts of nitrogen.	Literature							
218	Distribute information to farmers on what can happen with applied manure, what should be applied and reasonable, agronomic rates of application.	WGD							
219	Integrate use of animal waste and synthetic fertilizer, balancing nutrient application amounts so as to maximize crop production and full nitrogen uptake.	Literature							

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Ref. #	Action	Proposed by	Feasibility	Effectiveness	Cost	Proposed funding	Time	Difficulty to implement	Degree of consistency with local comprehensive plans and water management programs
220	Track nutrients and their application regardless of the end user, including commercial fertilizer.	L/C WG		Nutrients from animal waste are tracked now while in the control of dairy operations. Once those nutrients are transferred to a third party no further regulation exists.					
221	Keep track of synthetic fertilizer sales.	WGD							
222	Avoid fertilizer material and manure spills during transport, storage, and application.	WGD							
223	Use effective application schedules, placement, rate and time of application and speed of release for specific crop requirements.	Literature							
224	Where possible, apply nitrogen through to plant-specific root zone means, rather than broadcast application.	Literature							
225	Identify areas with highly permeable and susceptible soils where fertilization and pesticide application should be most carefully managed.	Literature							
226	Amend Yakima County Code 16C.09.070 to include excess fertilizer application to list of prohibited uses within critical aquifer recharge areas.	WGD							
227	Amend the list of prohibited uses under the Critical Aquifer Recharge Area ordinance 16C.09.070 (6) to include "activities that would add nutrients to the soil column beyond those amounts that can be taken up within a reasonable time by plant materials." Or perhaps, activities inconsistent with NCRS Code 590	Literature							
228	Inform farmers that fertilization and supplemental irrigation beyond the optimum rate will not necessarily produce better yields or higher profits without serious side effects.	WGD							
229	Develop an approach for data collection of volume and location of manure application off dairy sites.	WGD							
230	Place areawide limitation on number of acres where manure can be spread as fertilizer. Require permit to spread manure as fertilizer. Allow market in permits. Allow dairies to own permits which could be leased to other agricultural properties.	Literature							
231	Require soil sampling results and area fertilized from exported dairy manure as a precondition of exportation of dairy nutrients off dairy properties.	WGD		Problems: workability, potential conflict of interest if commercial fertilizer dealers are performing soil sampling for farmer/fertilizer customer.					
232	Regulate synthetic fertilizer and amount of water used if manure application is going to be regulated.	WGD							
233	Question sellers of synthetic fertilizers in order to learn their objectives, plans, strategies, seeking to discover win/win opportunities.	WGD							
234	Require a synthetic fertilizer or other nutrient applicators license (approach taken by pesticides, chemigation and fertigation) as condition to purchase nutrients.	WGD							
235	Require that "prescriptions" for soil amendment with organic or inorganic fertilizers be written by certified professionals, and that purchases of inorganic fertilizers limited to those for which prescriptions have been written.	Literature							

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Ref. #	Action	Proposed by	Feasibility	Effectiveness	Cost	Proposed funding	Time	Difficulty to implement	Degree of consistency with local comprehensive plans and water management programs
236	Establish “safety coefficients” limiting application of nitrogen, whether organic (manure) or inorganic (synthetic), to take into account the problem of intervening cause, e.g., change in the weather or water supply that makes the application or the prior application of nitrogen excessive in the event of change in anticipated circumstances.	Literature							
237	Place a small tax on sale of synthetic fertilizer in order to collect volume data.	GWACD							
238	Subsidize price of alfalfa to induce greater production so as to remove nitrogen from soils.	Literature							
239	Monitor the timing of application of fertilizers to fields and how much water was then applied.	WGD							
240	Request Washington Conservation Commission and WSU Extension to dedicate additional funding to Yakima Valley for education and outreach, BMP implementation, irrigation water management, soil nutrient management and manure management and application.	WGD							
241	Monitor changes occurring in agricultural operations because of efficiencies and economics. Evaluate whether those changes positively affect improvement in groundwater quality.	WGD							
242	Develop a system that could be used to determine which farmers need assistance in understanding appropriate farming practices—establish a structure of recommendations establishing clear expectations, list problematic management practices, encourage voluntary compliance, develop peer encouragement system	WGD							
243	Investigate use of bio-char in lieu of nitrogen fertilizers	GWACD							
244	Recommend against farming around a water well.								
245	Intermittent fallowing (leaving lands dormant) to reduce both natural plant nitrogen and fertilizer nitrogen additions to the soil.	Literature							
246	Refrain from tilling under herbaceous remnants of prior crops, reducing plant nitrogen contributions to soil column.	Literature							
No Action									
247	Consider costs of health risks to families from nitrate exposures, costs incurred by growers and producers of various recommendations, costs of bottled water, costs to connect to public water or sewer systems, cost for WSDA to monitor DNMP, costs of soil sampling	WGD							

	sort	QUESTION	YES	NO	AYE	SOURCE	Sort1	Sort2	Sort3
11	1	Q1A - Pump, treat and reinject groundwater	0	14	0	WGD	Remediation	Treat	1
28	2	Q2A - Pump-and-fertilize. Use existing (or new) agricultural water wells to remove nitrate-contaminated groundwater and treat the water by using it to irrigate crops which will take up the nitrogen concentration in the irrigation water (presumes the existence of a proper nutrient management plan for the irrigated acreage).	1	9	4	Literature	Remediation	Treat	2
15	3	Q3A - Fill irrigation ditches with water and let it sit there to leak into groundwater. Use groundwater recharge as a means to dilute nitrate concentrations in the groundwater.	0	9	5	WGD	Remediation	Treat	3
2	4	Q4A - Drill new 1,500 foot wells to replace contaminated wells .	1	9	4	WGD	Remediation	New Well	1
3	5	Q5A - Regionalize and connect users to a larger system with reliable quality water pipe connection to an existing system	4	5	5	WGD	Remediation	Region - water	1
39	6	Q6A - Blend better quality water with contaminated water to reduce nitrate concentrations	2	6	5	Literature	Remediation	Treat	8
27	7	Q7A - Construct a potable water line from nearby developed area into deadhead water stations at central rural location (permit potable water collection at deadhead water stations).	0	8	5	Literature	Remediation	Region - water	2
8	8	Q8A - Discontinue use of shallow wells. Rebuild, repair or replace poorly constructed wells.	6	5	3	WGD	Remediation	New Well	2
19	9	Q9A - Remediate local nitrate contamination hotspots only .	2	5	7	Literature	Remediation	Treat	4
33	10	Q10A - Identify or create an organization (Lead Entity) responsible for implementation and oversight of the LYV GWMA Groundwater Management Plan and acquisition of stable funding to support their activities. Potential entities include, Yakima County, South Yakima Conservation District (SYCD), Yakima County Health District, Washington State Department of Agriculture (WSDA), Ecology, and/or a yet to be formed entity.	11	0	3	L/C WG	Admin/Lead	Lead	3
4	11	Q11A - Implement an Adaptive Management Plan utilizing data collected, progress made, or lack of progress to inform the community on adjustments that need to be implemented. Plan could incorporate availability of technology, education and outreach, tracking exports, land use regulations, treatment systems, and other changes to inform decision makers regarding management changes necessary for a successful program.	10	0	4	L/C WG	Admin/Lead	Adapt	1
14	12	Q12A - Let the lead agency determine who will do monitoring. Possible assignment of long-term monitoring after 2017 to Yakima Health District.	8	2	4	WGD	Admin/Lead	Monitor	5
29	13	Q13A - Inform livestock operators and facilitate a dialogue with representatives of the regulatory agencies, other agricultural producers, and the general public through a public information/education program to protect the quality of the area groundwater resource. Information and incentives provided to Lower Yakima Valley agricultural operators will expedite implementation of BMPs.	9	1	4	L/C WG	Admin/Lead	ED	10
56	14	Q14A - Collect, analyze, and interpret data to track water quality improvement progress, nutrients IMPORTED, generated, applied, or exported, which will inform the implementation of an Adaptive Management Plan within the LYV GWMA.	9	1	4	L/C WG	Admin/Lead	Monitor	7
14	15	Q15A - Focus implementation of analyzed data BMPs based on information and data included in the Nitrogen Loading Assessment, Soil Sampling Program, Ambient Groundwater Monitoring Plan, USGS Reports, and other similar scientifically based publications.	7	3	4	L/C WG	Admin/Lead	Implement	1
24	16	Q16A - Increase education and outreach efforts by improving the availability of technical assistance to develop nutrient management plans for all livestock industries. Assist industry trade organizations to enhance their local efforts to bring information to their members. Help increase livestock operator awareness of the need for procedures for proper management of animal wastes and wastewater. Potential funding sources include industry, government, educational institutions, grants, industry associations, etc...	9	3	2	L/C WG	Admin/Lead	ED	7

7	17	Q17A - Cooperate with the WCC and WSDA in their efforts to document regulatory compliance for dairies within the GWMA that are completing and implementing Dairy Nutrient Management Plans (DNMP). Explore the possibility of disclosing non-proprietary data produced through the DNMP process.	9	1	4	L/C WG	Admin/Lead	DNMP	1
12	18	Q18A - Further develop a local forum for disseminating information and facilitating technical exchange regarding BMPs for livestock management and groundwater protection. Endorse and distribute materials by all effective means that will educate the public about the facts of livestock waste management and the science of groundwater protection. Include all fertilizer types	10	3	1	L/C WG	Admin/Lead	ED - NMP	1
45	19	Q19A - Quantify the nutrient value and rate of release of nitrate from livestock waste under various Lower Yakima Valley conditions to become part of the nutrient management guidelines.	9	2	3	L/C WG	Admin/Lead	DNMP	5
14	20	Q20A - Voluntary development and implementation of NMPs by operations not already required to hold permits or a DNMP as an effective means of environmental protection.	6	3	5	L/C WG	Admin/Lead	NMP	2.1
1	21	Q21A - Allocate cost share funding or other funding assistance to PEOPLE implementing environmental protection measures.	7	3	4	L/C WG	Admin/Lead	FUND	2
5	22	Q22A - Develop strategies for marketing the economic, fertilizer value, and soil enhancing properties of appropriate application of manure and other livestock wastes.	7	2	5	L/C WG	Admin/Lead		1
15	23	Q23A - Provide Yakima County fiscal support to maintain its GIS data base on the GWMA over time. Maintain a GIS data base on the GWMA over time.	11	1	2	Literature	Admin/Lead	Lead	1
6	24	Q24A - Overlay GIS density maps reflecting different sources of nitrogen in order to geographically indicate the total density from all sources.	9	3	2	Literature	Admin/Lead	Research	2
11	25	Q25A - Map those areas that can tolerate more nitrogen application and areas that are more vulnerable to its application. High risk vs low risk (from immediate impact perspective)	6	3	5	Literature	Admin/Lead	Research	3
16	26	Q26A - Use USGS particle tracking model to indicate where groundwater moves faster (permeability).	5	2	7	WGD	Admin/Lead	Research	4
18	27	Q27A - Assess groundwater contamination potential, making use of the available information on soils, geology, and groundwater in order to identify those areas that are the most vulnerable to contamination. These areas may be closer to surface water, areas where recharge is faster or more frequent, or areas where shallow soils overlie soluble bedrock. Identify strategies upstream of sensitive areas to reduce contributions of nitrate sources.	7	4	3	WGD	Admin/Lead	Research	1
26	28	Q28A - Enact County ordinances that would affect the problem grower.	3	4	7	WGD	Admin/Lead	Regulation	8
25	29	Q29A - Maintain the County's GWMA website.	11	0	2	WGD	Admin/Lead	Lead	2
7	30	Q30A - Postpone decision on creation of an aquifer protection area till a later date when more information is known.	1	5	8	WGD	Admin/Lead	FUND	1
4	31	Q31A - Consider the enactment of a county ordinance addressing the density of segments of nitrate producing agricultural activity within the areas currently zoned as agricultural within the GWMA.	2	8	4	WGD	Admin/Lead	Reg - Zon	1
7	32	Q32A - Consider creation of subcategories of agricultural zoning, limiting density in those areas where soils are more permeable or groundwater moves faster.	5	8	1	WGD	Admin/Lead	Reg - Zon	2
27	33	Q33A - Consider overlay zoning ordinance adding special groundwater conservancy restrictions to otherwise conventionally zoned properties. Uses consumptive of groundwater quality resources are precluded or more generally regulated. Uses that are not consumptive of groundwater quality resource are permitted. Specific limitations might include limitations of water use, drainage, development density, septic use.	1	7	6	Literature	Admin/Lead	Reg - Zon	3
20	34	Q34A - Define a conditional uses that can be allowed after assurance that groundwater resources would not be damaged.	3	7	4	Literature	Admin/Lead	Reg - Zon	9
9	35	Q35A - Consider a county ordinance concerning over application of manure.	6	6	2	WGD	Admin/Lead	Regulation	6

4	36	Q36A - Create county ordinance limiting total number or density of cows or dairies (lid).	3	9	2	WGD	Admin/Lead	Reg - Zon	5
28	37	Q37A - Adopt a LYC GWMA or county-wide CAFO ordinance	3	6	4	L/C WG (no consensus in WG)	Admin/Lead	Reg - Zon	7
49	39	Q39A - Establish a quota system through zoning regulations establishing how much nitrogen could be applied (based on agronomic rates for individual crop types) within fixed zones.	0	10	4	WGD	Admin/Lead	Regulation	10
32	40	Q40A - Consider density limitations, building codes for farm structures, development standards for farm activities.	1	7	6	WGD	Admin/Lead	Reg - Zon	5.5
41	41	Q41A - Regulate crop mix to weight more toward nitrogen-light crops--	0	12	2	Literature	Admin/Lead	Regulation	11
47	42	Q42A - Consider limitation of septic systems (therefore building permit) where soil filtration rate is high, where housing density is already big, where nitrate concentration is already great downstream of the septic plume	5	2	7	Literature	Admin/Lead	Septic	10
48	43	Q43A - Property tax for properties with onsite septic systems, waived in the case of proper inspection and pumping	2	8	4	Literature	Admin/Lead	Septic	13
73	44	Q44A - Protect Critical Aquifer Recharge Areas	9	3	2	WGD	Admin/Lead	Reg - Zon	23
10	45	Q45A - Require bonding as prerequisite to permitting of livestock operations so as to assure financial capability for clean up in the instance of bankruptcy or other economic failure.	3	8	3	GWACD	Admin/Lead	Regulation	12
39	46	Q46A - Measure the effects of GWAC program on Yakima County economics.	5	4	5	WGD	Admin/Lead	Economics	1
8	47	Q47A - Establish a more interactive and frequent relationship between Yakima County and NRCS.	3	2	9	WGD	Admin/Lead	ED	14
23	48	Q48A - Develop post GWAC education and outreach campaign	8	1	5	EPO	Education	ED	1
9	49	Q49A - Broaden the pool of people GWMA is educating or communicating with.	10	2	2	EPO	Education	ED	2
9	50	Q50A - Maintain a public education program regarding nitrate pollution and health risk over a 5-10 year period. Provide all materials distributed to the public in English and Spanish.	10	2	2	EPO	Education	ED - HEALTH	1
35	51	Q51A - Billboard campaign - urging well testing	2	4	8	EPO	Education	ED	3
74	52	Q52A - Create 1 FTE Bilingual Outreach Coordinator Position to implement a post-adoption outreach campaign (EPO meeting summary 8/1/2014 & proposed to GWAC 8/21/14 - voted low priority)	3	8	3	EPO	Education	ED	13
42	53	Q53A - REVISE Develop a K-12 education program about groundwater and best management practices--mobile program visiting schools.	4	5	5	EPO	Education	ED	12
11	54	Q54A - Employ/enlist college students to conduct surveys, consider outreach methodologies as part of classwork to assist with GWMA education	4	3	7	EPO	Education	Research	11
13	55	Q55A - Educate the public, particularly in towns, about lawn and garden nitrogen applications' contribution to nitrate concentrations	6	1	7	EPO	Education	ED - LAWN	1
18	56	Q56A - Educate private well owners: Re: protect your family; know who's at risk; test your well regularly.	8	3	3	EPO	Education	ED - WELL	4
10	57	Q57A - Private well owners responsibility to protect WQ	5	3	6	EPO	Education	ED - WELL	5
8	58	Q58A - Publish public information about proper septic system construction and operation	8	2	4	EPO	Education	ED - SEPTIC	3
16	59	Q59A - Advise the public that GWMA is looking for abandoned wells. Wellhead protection education	7	2	5	EPO	Education	Abandoned Wells	3
35	60	Q60A - Offer incentives for property owners to identify and properly abandon wells.	6	2	6	EPO	Education	Abandoned Wells	5
36	61	Q61A - Offer incentives to drill deeper wells for homeowners served by shallow, poorly constructed, poorly located wells.	4	3	7	EPO	Education	New Well	3
41	62	Q62A - Offer incentives to connect households on private wells near community water systems to connect to a community water system. (Nitrate Treatment Pilot Program-June 2011)	5	3	6	EPO	Education	Region - water	3
6	63	Q63A - Provide a resource hotline (as proposed by RCIM on 8/2014)	6	5	3	EPO	Education	ED	15
26	64	Q64A - Prepare a fact sheet/develop outreach campaign to growers that explains agronomic rates, applying nutrients at the right time/right place/right amount	7	3	4	EPO	Education	ED - NMP	2
40	65	Q65A - Study report outreach: Show/Identify how much nitrogen is left after nutrient uptake in crops.	4	4	6	EPO	Education	Research	6

1	66	Q66A - Encourage commodity groups to provide education on water management and fertilizer use through regular meetings.	14	0	0	EPO	Education	ED	4
10	67	Q67A - Outreach targeted to small farm/hobby farm/ranchettes manure management	7	2	5	EPO	Education	ED - HOBBY	1
24	68	Q68A - Educate irrigation users on the consequences of too much irrigation.	11	3	0	EPO	Education	ED - IRRIG	1
25	69	Q69A - Inform farmers about technological improvements in irrigation that permit easier management of water, descriptions of specific improved technology, and economic viability of technological advancements .	10	2	2	EPO	Education	ED - IRRIG	2
27	70	Q70A - Enlist advocacy groups/Farm Bureau/federations/associations to host workshops/informational meetings regarding GWMA education goals and partnerships in success	8	0	6	EPO	Education	ED	8
5	71	Q71A - Make presentations at trade shows, communicate with agricultural consultants who have positive relationships with farmers suggesting that they change practices	6	3	5	EPO	Education	ED	9
11	72	Q72A - Partner with UW Pediatric Environmental Health Specialty Unit (PEHSU) to continue training local healthcare providers to recognize and address Nitrate risk in their patients (pregnant women and infants up to six months)	8	3	3	EPO	Education	ED - HEALTH	2
16	73	Q73A - Advise the public that GWMA is looking for abandoned wells	8	5	1	WGD	Education	Abandoned Wells	4
32	74	Q74A - Encourage commodity groups to provide education on water management and fertilizer use through regular meetings Duplicate with Q66A	11	3	0	WGD	Education	ED	5
38	75	Q75A -Have DOH continue to Inform the public about the health risks related to nitrates in drinking water	11	2	1	Jean Medoza	Education	ED - HEALTH	3
36	76	Q76A - Provide education about concepts that people must understand in order to evaluate our plans for reducing nitrate in groundwater.	7	4	3	J Mendoza		ED	16
72	77	Q77A - Use both method-based measurement and performance-based measurement.	5	2	7	WGD	Research / Data Collection	Monitor	13
26	78	Q78A - Establish performance objectives against which monitoring data can be compared--number of at risk wells, BMP implementation, funding success, reduction in number of underperforming farming practices	6	2	6	Literature	Research / Data Collection	Monitor	11
34	79	Q79A - Implement Ambient Groundwater Monitoring Plan	14	0	0	GWAC	Research / Data Collection	Monitor	2
51	80	Q80A - Implement Drinking Water Quality Monitoring Plan	13	0	1	GWAC	Research / Data Collection	Monitor	3
1	81	Q81A - Establish a fund and plan to analyze data collected in ambient water quality monitoring and drinking water well monitoring programs. Study short-term seasonal variations in nitrate concentrations over next year or two--addresses how changes in nutrient application over the agricultural cycle affects things. Study long-term trends that develop over several years--to track whether the overall picture is getting better, whether changes recommended by GWMA are having impact.	10	0	4	WGD	Research / Data Collection	Monitor	6
70	82	Q82A - Use hydro-geologically directed monitoring well placement to detect cause/effect remediation opportunities.	5	4	4	Literature	Research / Data Collection	Monitor	1

32	83	Q83A - Building from the WSDA's Nitrogen Availability Assessment, develop a Nitrogen Loading Assessment for all agricultural, residential and commercial properties, using newly collected data. Hire a technical consultant to conduct a literature review to determine the most relevant information and accurate factors for use in the Nitrogen Loading Assessment. Periodically repeat the grower survey used in the Nitrogen Availability Assessment to compare against the currently established data. Collect data on how many acres in the GWMA are fertilized in various crops with manure and how many with commercial fertilizer. Update and monitor the percentage of acreage in various crops, particularly silage corn and field corn. Study effect of contribution of nitrogen from cover crops used to form mulch. Determine acreage for triticale. Discover commercial fertilizer tonnage for Yakima County and/or for GWMA. Explore how much nitrogen leaches into groundwater from drains and wasteways. Study atmospheric deposition more comprehensively. Understand the difference between plant uptake and plant removal of nitrogen.	5	3	6	WGD, Literature	Research / Data Collection	Research	10
16	84	Q84A - Get fertilizer loading numbers per crop type. Get economic engine factors per crop type. Determine crop/fertilizer utility ratios. Consider economic benefit of various crop type categories. Consider agricultural usage categories (e.g., field crop, row crop, vineyard, orchard, dairy. Determine amount of land appropriate for each, and location best for each given soil, climate, effect upon groundwater, etc. Ensure adequate supply of each in order to permit opportunity of market choice.	3	7	4	Literature	Research / Data Collection	Research	7
10	85	Q85A - Recommend that the Yakima Health District or Yakima County continue the High Risk Well Assessment (survey to identify outreach messaging related to health risks and well sampling) periodically over a 5-10 year period. Collect more information on wells known to have high nitrate concentrations, perhaps identifying whether the concentration is self-caused	8	5	1	WGD	Research / Data Collection	Monitor	1
44	86	Q86A - Conduct recurrent drinking water testing where drinking water standards have previously been exceeded.	8	2	4	Literature	Research / Data Collection	Monitor	4
46	87	Q87A - Design and implement pilot studies focusing on innovative farm techniques which reduce nitrogen loading to crops and monitor results for future expansion of findings. Wsu	6	5	3	Literature	Research / Data Collection	Research	12
78	88	Q88A - Explore whether nitrate leaching is greater with vetch amended soil or commercial fertilizer amended soil. The results of one study indicate that vetch nitrogen, in comparison to fertilizer nitrogen, leads to lower concentrations of soil inorganic nitrogen and greater immobilization of added nitrogen in soil organic matter. This would reduce the potential for nitrate leaching.	2	6	6	Literature	Research / Data Collection	Research	13
36	89	Q89A - Recommend that WSU Extension Service update Appendices A and B of the Washington Irrigation Guide.	9	0	5	WGD	Research / Data Collection	Research	14
40	90	Q90A - Recommend that Western Fertilizer Handbook, Western Plant Health Association, Ninth Edition (2002) be updated.	8	0	6	WGD	Research / Data Collection	Research	8
49	91	Q91A - Fund professional adaptation of Utah Fertilizer Guide for Washington State http://extension.wsu.edu/files/publications/publication/AG_431.pdf	1	4	9	Literature	Research / Data Collection	Research	9
16	92	Q92A - Develop Nitrogen Loading Assessment as provided in Research and Data Collection above.	4	2	8	WGD	WSDA	Research	15
18	93	Q93A - Summarize the DNMP reporting and provide information that would disclose the amount of manure the CAFO's in the GWMA created and where it was distributed.	6	6	2	WGD	WSDA	DNMP	3
5	94	Q94A - Review and evaluate the WSDA Dairy Nutrient Management Program inspection "protocols" to assist in determining if additional resources should be allocated and identify any areas for improvement of the inspections themselves.	11	1	2	L/C WG	WSDA	DNMP	6
50	95	Q95A - Add staff to WSDA to oversee Dairy Nutrient Management Plans and complaints regarding manure spills.	6	1	6	WGD	WSDA	DNMP	2

29	96	Q96A - Promote on-going research for managing animal nutrients.	9	1	4	WGD	WSDA	Research	16
23	97	Q97A - Ask SYCD for projected plan to expand fiscal and administrative capacity	3	6	5	Literature	SYCD	SYCD	6
42	98	Q98A - Fund post GWMA education and outreach through Conservation District	7	3	4	WGD	SYCD	SYCD	5
34	99	Q99A - Put request for \$\$\$ for SYCD in State Conservation Commission budget	8	3	3	WGD	SYCD	SYCD	4
67	100	Q100A - Enhance engineering expertise (personnel) within Conservation District--none there or at NRCS	5	2	7	WGD	SYCD	SYCD	7
13	101	Q101A - Charge dairies for Conservation District preparation of Dairy Nutrient Management Plans	3	7	4	WGD	SYCD	DNMP	9
2	102	Q102A - Recommend funding for Southern Yakima Conservation District review of Dairy Nutrient Management Plans	8	4	2	WGD	SYCD	SYCD	3
52	103	Q103A - Provide better funding and more staffing for Conservation District: hard money funding, increase property tax assessment, create exceptions to taxation for demonstrated testing and monitoring.	4	3	7	WGD	SYCD	SYCD	1
20	104	Q104A - Develop water absorption graph or chart. List volumes of water applied, soil types, absorption/compaction rates, depths to water, pre-season and post-season appropriate moisture levels. Holding capacity, infiltration rate, evapotranspiration,	3	5	6	Literature	SYCD	Research	17
21	105	Q105A - Use USGS Particle Tracking Model	5	3	6	WGD	USGS	Research	4.1
44	106	Q106A - Use USGS particulate tracking model to identify targets of education	3	4	7	WGD	USGS	Research	4.2
37	107	Q107A - USGS Particle Tracking Model Overview--potentially combined with MT3D MODFLOW application to the vadose Zone	3	2	9	WGD	USGS	Research	4.3
15	108	Q108A - Study potential nitrate contamination attributable to improperly operated septic systems. Consider restoration/retrofit of older septic systems through incentives or county property tax breaks.	6	4	4	WGD	YHD	Septic	3
43	109	Q109A - Drill deeper water wells further from septic drain systems	4	4	6	WGD	YHD	New Well	4
7	110	Q110A - Require builders to demonstrate that septic system design will not add to nitrogen loading problem as condition of construction	3	7	4	WGD	YHD	Septic	11
63	111	Q111A - Publish and distribute homeowner guide on how to use in maintain septic systems	7	2	4	WGD	YHD	Septic	2
1	112	Q112A - Publish the Department of Ecology's lists of certified laboratories that can test private wells for nitrates and pathogens and Ecology's providing funding to low income, private well users, in order to conduct this testing.	8	2	4	WGD	DOE	Test	
2	113	Q113A - Encourage an increase in the number and availability of soil testing laboratories.	4	5	5	Literature	DOE	SOIL	1
31	114	Q114A - Make grants that complement projects related to non-point-source GROUNDWATER pollution.	3	5	6	WGD	DOE	FUND	3
4	115	Q115A - Provide grant funding for well decommissioning.	7	2	5	WGD	DOE	Abandoned Wells	11
21	116	Q116A - Search for abandoned wells.	4	5	5	WGD	DOE	Abandoned Wells	2
23	117	Q117A - Send a postcard to 10 % of known property owners on record having a well asking about knowledge of older wells.	5	6	3	WGD	DOE	Abandoned Wells	6
34	118	Q118A - Compare Google Earth to Yakima County GIS images to determine building changes and thus possible well usage changes. Focus first on hotspot high density areas in GWMA. Ground truth suspected problem wells.	3	9	2	WGD	DOE	Abandoned Wells	7
37	119	Q119A - Educate realtors and banking industry about disclosure of abandoned wells in property transfers.	9	2	3	WGD	DOE	Abandoned Wells	13
26	120	Q120A - Educate public regarding liability of an ill-secured well.	9	2	3	WGD	DOE	Abandoned Wells	14
45	121	Q121A - Provide some form of protection for self-reporting of abandoned or improperly decommissioned wells.	9	2	3	WGD	DOE	Abandoned Wells	9
35	122	Q122 - Seek legislative change on requirements for well decommissioning, making them cheaper.	4	4	6	WGD	DOE	Abandoned Wells	16

37	123	Q123A - Amend RCW 18.104.055 to dedicate a portion of a notice of intent fees to a fund to be used by Ecology (or Health) for the proper decommissioning of wells in those cases where DOE (or Health) determines that such publicly-funded action is necessary in the public interest to protect or enhance the quality of public health (infirmity of the public health).	4	1	8	Literature	DOE	Abandoned Wells	12
41	124	Q124A - Amend authority of Department of Ecology to gain access to properties where manure is spread outside land subject to nutrient management plans	5	5	3	WGD	DOE	NMP	13
47	125	Q125A - Encourage municipalities within the GWMA to extend municipal sewer systems within urban growth areas and retire ROSS and LOSS.	5	1	8	RCIM WG	Remediation	Region - sewer	4
52	126	Q126A - Encourage connection of residences within urban growth zones to sewer systems extended by municipalities.	9	2	2	RCIM WG	Remediation	Region - sewer	5
61	127	Q127A - Encourage the development of group septage-management or treatment systems in areas outside urban growth zones where the density of residential development could exacerbate the effect of multiple OSS on groundwater quality.	6	3	5	RCIM WG	Remediation	Region - sewer	6
17	128	Q128A - Establish or maintain ongoing, extended funding necessary for the Yakima County Department of Public Services and Yakima Health District to actively participate in water quality improvement, testing, monitoring, scientific data analysis, and infrastructure development.	10	1	3	RCIM WG	RCIM	Monitor	8
57	129	Q129A - Request that the Yakima Health District prepare a plan, as required and described by WAC 246-272A-0015, giving primary emphasis on educational programs for operation and maintenance of existing on-site septic systems (OSS), reserving a determination regarding the advisability of the establishment of regulatory or enforcement programs until data is available from the GWMA's monitoring well system.	4	4	6	RCIM WG	RCIM	Septic	4
81	130	Q130A - Request Yakima County Public Services to perform an engineering study of locations outside urban growth areas where there is rural residential medium to high density OSS and the nitrate concentration is greater than the state water quality standard where community waste water systems could feasibly be constructed in lieu of individual on-site septic systems.	3	5	5	RCIM WG	Remediation	Region - sewer	7
51	132	Q132A - Request the Yakima Health District to consider the nitrate density element when approving proposed septic systems, including those technologies verified by the U.S. EPA's Environmental Technology Verification Program, for reducing the nutrient nitrogen in domestic wastewater discharged from OSS, including fixed film trickling filter biological treatment, media filter biological treatment, and submerged attached-growth biological treatment.	5	3	6	RCIM WG	RCIM	Septic	15
37	133	Q133A - Recommend that soil testing be performed below at least two ROSS drain fields (one with a shallow water table, one with a deeper water table) in high density areas to analyze nitrogen loads as the septage approaches the water table.	6	2	6	RCIM WG	RCIM	Septic	16
66	134	Q134A - Request that the State Department of Health determine, prior to issuing or reissuing LOSS permits, that all employee counts are regularly reported, so that the LOSS will continue to operate as designed.	6	3	5	RCIM WG	RCIM	Septic	8
68	135	Q135A - Recommend that the State Department of Health consider not approving additional LOSS or otherwise require an effective nitrate removal system.	4	5	5	RCIM WG	RCIM	Septic	9
79	136	Q136A - Request that the Department of Ecology analyze the trends of nitrate data contained within reports required by NPDES and SWD permits.	6	3	5	RCIM WG	RCIM	Monitor	10
62	137	Q137A - #1Educate the public regarding the importance of the integrity of wells, particularly those without a well log, and #2((fund and encourage periodic well inspection by the Yakima Health District or professional well engineers.))	6	5	3	RCIM WG	RCIM	Abandoned Wells	15
3	138	Q138A - Require that site inspections for possible abandoned wells be performed before building permits are issued for properties that are proposed to be redeveloped after prior development of domestic, agricultural or industrial uses.	8	3	3	RCIM WG	RCIM	Abandoned Wells	8

82	139	Q139A - Request that the Department of Ecology develop a plan for finding and decommissioning abandoned wells in the next 12 months, using the LYVGWMA as a pilot project. Revise as needed	6	3	5	RCIM WG	RCIM	Abandoned Wells	1
45	140	Q140A - Permit the repair or decommissioning of wells by general contractors, rather than exclusively by well-drillers, so as to diminish costs of decommissioning.	6	3	5	RCIM WG	RCIM	Abandoned Wells	17
19	141	Q141A - Assist hobby farmers to locate ROSS drain fields on their property so as to avoid animal farming over the drain field. (Part of septic maintenance literature)	4	6	4	RCIM WG	RCIM	Septic	12
27	142	Q142A - Request the county include the EPO flyer on OSS maintenance in correspondence with GWMA home owners for 5 years. i.e. tax bills, property transfers.	10	2	2	RCIM WG	RCIM	Septic	1
33	143	Q143A - Make facility process improvements in waste treatment and food processing plants to reduce nitrogen and total discharge volume.	6	2	6	Literature	RCIM	Septic	6
77	144	Q144A - Replace aging sewer system infrastructure and ensure proper system maintenance to reduce nitrate leaching.	7	3	4	Literature	RCIM	Septic	7
10	145	Q145A - Require new developments to address impacts on groundwater quality through permitting review of a site plan review criteria.	6	2	6	Literature	RCIM	Regulation	14
24	146	Q146A - Identify and support opportunities, including educational research institutions, for private, public, and industry investment in technology specific to addressing nitrate contamination in groundwater.	9	1	4	L/C WG	Technology	Technology	2
30	147	Q147A - AKART--industry can't keep up with technology, required if performance already meets performance standards?	1	6	5	WGD	Technology	Technology	5
22	148	Q148A - AKART problems--does standard mandate installation of new technologies even when existing ones accomplish the measured objective	0	6	5	WGD	Technology	Technology	6
53	149	Q149A - Require nitrogen reducing technologies for onsite septic systems if and where appropriate	3	3	8	WGD	Technology	Septic	5
54	150	Q150A - Explore public investment in waste to energy technology	6	2	6	WGD	Technology	Research	18
88	151	Q151A - Promote new products that are found through research	5	6	2	WGD	Technology	Research	19
56	152	Q152A - Promote markets for those products	3	6	4	WGD	Technology	Research	20
6	153	Q153A - Use commodity group "check off" money for research and development	3	3	8	WGD	Technology	Research	21
31	154	Q154A - Inform farmers of those BMPs prioritized by Livestock/CAFO and Irrigated Agriculture Work Groups from HDR list to reflect greatest effectiveness in nitrate reduction	11	0	3	WGD	BMPs	BMP	1
12	155	Q155A - Determine who implements the BMP and who monitors it and the time frame in which to measure/monitor it--problem with available expertise, timing, installation cost	6	2	6	WGD	BMPs	BMP	3
34	156	Q156A - Identify and publish a list of poor management practices. Recommend that they be terminated or avoided.	8	2	4	Literature	BMPs	BMP	4
21	157	Q157A - Establish a BMP monitoring well network. Monitor BMP performance and effectiveness with the monitoring well network first, then monitor water quality.	5	4	5	Bowen	BMPs	Monitor	12
22	158	Q158A - Recommend that dairies and CAFOs use those Best Management Practices contained within Attachment B to the Livestock/CAFO Work Group's Report to GWAC	7	0	7	L/C WG	Livestock	BMP	2
21	159	Q159A - Encourage the WSDA and Conservation Districts to continue education and outreach to livestock agriculture operators about impacts and practices related to compliance with relevant State and federal requirements for groundwater protection, particularly addressing those not currently acting in good faith toward that objective.	12	1	1	L/C WG	Livestock	CAFO	2
83	160	Q160A - Implement an Education and Outreach Program (EOP) informing producers of Best Management Practices (BMP's) including increased funding for the DNMP assistance program.	9	2	3	L/C WG	Livestock	ED	6
9	161	Q161A - Create and maintain a central depository of public information online, as part of an Education and Outreach Program (EOP) informing producers of the nitrate issue, community impacts, and Best Management Practices (BMP's).	10	1	3	L/C WG	Livestock	ED	17

6	162	Q162A - Increase funding for the local Conservation District and Natural Resources Conservation Service (NRCS) so that assistance programs for nutrient management planning, engineering, cost share, and loan funds are more available.	8	3	3	L/C WG	Livestock	SYCD	2
64	163	Q163A - Streamline current enforcement activities so as to improve customer service and protocols, increase clarity of process, escalate enforcement for facilities not following management practices, identify methods to discourage repeatedly unfounded complaints, and improve overall transparency.	9	1	4	L/C WG	Livestock	Regulation	15
20	164	Q164A - Collect data to track water quality improvement progress and nutrients generated, applied, or exported within the LYV GWMA. Generate data through soil testing, Ambient Groundwater Monitoring Plan implementation - including purpose built and existing wells, sampling of liquid and solid waste to be field applied, composted, or exported, the CAFO General Permit, and tracking nutrients applied by non-dairy operations.	9	2	3	L/C WG	Livestock	Monitor	9
39	165	Q165A - Support and advocate private, public, and industry investment in technology, including at research institutions, specific to addressing nitrate contamination in groundwater, especially where it creates improvements for the public good.	10	1	3	L/C WG	Livestock	Technology	1
14	166	Q166A - seek more complete disclosure of Dairy Nutrient Management Plans.	6	3	5	WGD	Livestock	DNMP	4
43	167	Q167A - Incentivize technology and management of fertilizers and manures.	4	1	9	WGD	Livestock	Technology	3
35	168	Q168A - Install separation systems--separate liquids from solids.	3	2	9	WGD	Livestock	Technology	4
50	169	Q169A - Use anaerobic digestion in waste storage lagoons bmp	2	3	9	WGD	Livestock	Technology	7
75	170	Q170A - Install liners in liquid waste storage lagoons.	4	2	8	WGD	Livestock	CAFO	6
60	171	Q171A - Install impervious surfaces beneath silage/food storage. Recommend	6	2	6	WGD	Livestock	DNMP	13
25	172	Q172A - Revise WAC 246-203-130 so that it defines "health hazard" and "nuisance" and includes specific and enforceable requirements designed to protect human health.	3	6	5	WGD, Literature	Livestock	Regulation	24
59	173	Q173A - Compost more manure	4	1	9	WGD	Livestock	CAFO	7
8	174	Q174A - Improve composting regulations	6	2	6	WGD	Livestock	CAFO	8
38	175	Q175A - Provide underlying soils information to each livestock operation so that individual evaluations can be made. Part Of DNMP	6	6	2	Literature	Livestock	SOIL	2
3	176	Q176A - Remove wastes from barnyards and other areas of animal concentrations and frequently convey them to waste storage or treatment facilities.	4	2	8	Literature	Livestock	CAFO	3
13	177	Q177A - Prevent contaminants from flowing into wells by ensuring that the external areas around well casings are properly sealed and that wastes are kept the recommended distance from wells.	9	2	3	Literature	Livestock	Well	1
15	178	Q178A - Entrain water (as rain or snow-melt) collected from roofs away from animal pen or manure collection facilities.	7	3	4	Literature	Livestock	CAFO	4
3	179	Q179A - Drain Eliminate low areas where ponds water accumulates in corrals etc. to collect and manage waste waters.	3	6	4	Literature	Livestock	CAFO	5
3	180	Q180A - Treat manure supply in excess of that which can reasonably be applied as nutrient to agricultural lands as a waste product. Apply waste management strategies including land disposal at designated site, incineration, centralized waste-to-energy facility.	2	7	4	Literature	Livestock	Regulation	6
54	181	Q181A - Create a state CAFO Siting Team, composed of representatives of relevant state agencies with support from USGS, to which the county commission could refer proposed CAFO sitings or expansions. The CAFO Siting Team would provide a recommended site suitability determination, based upon a predetermined scoring system, including description of environmental risk factors and mitigation strategies.	3	2	9	WSDA, Gary Bahr	Livestock	CAFO	1
12	182	Q182A - Amend Dairy Nutrient Management Act to extend WSDA's authority to land application acreage (off dairies) with which dairy facilities contract pursuant to nutrient management plans. Wants other nutrient sources too Ginny	8	2	4	Literature	Livestock	DNMP	7

18	183	Q183A - Anecdotal results of deep soil sampling carried out by SYCD with farmers with pre-existing relationship with SYCD were informative. Word-of-mouth reporting within farmer community greatly increased acres sampled. Establish a multi-year deep soil sampling program where farmers subscribe for a duration with pre-determined fiscal remuneration for completed sampling. Cost share with farmer. Farmer to provide checklist indicating performance with BMPs. Test throughout growing year, in order to observe effects of fertilization throughout year. Share data with public.	7	0	7	WGD	Irrigated Ag	SOIL	3
48	184	Q184A - Do deep soil sampling on fields within GWMA that apply biosolids.	6	4	4	WGD	Irrigated Ag	SOIL	4
28	185	Q185A - Make shallow (1, 2, 3 foot) soil testing reports prerequisites for funding, lending or building permits.	1	10	3	WGD	Irrigated Ag	SOIL	5
80	186	Q186A - Hire soil scientists to do publicly funded "spot auditing" soil checks for feedback to farmers and fertilizer sellers.	3	6	5	Literature	Irrigated Ag	SOIL	6
38	187	Q187A - Incentivize development of technologies and provide information about improvements made in nutrient management and agronomic rate application of fertilizer by specific developing technologies	6	3	5	Literature	Irrigated Ag	NMP	15
76	188	Q188A - Commission the creation of a data assembly software that could receive, translate, assemble and analyze the data produced by agricultural equipment technology manufactured by different agricultural equipment manufacturers, so as to permit integration of data per field, crop or enterprise.	4	4	6	WGD, Doug Simpson	Irrigated Ag	Technology	8
39	189	Q189A - Monitor nitrate concentrations of irrigation water at headgates.	3	4	7	Literature	Irrigated Ag	Monitor	14
23	190	Q190A - Stimulate news coverage of progress in irrigation technology.	6	6	2	WGD	Irrigated Ag	ED	18
9	191	Q191A - Land acquisition purchase properties with greatest nitrate contribution and retire uses that generate nitrate.	0	11	3	Literature	Irrigated Ag	FUND	7
46	192	Q192A - Incentives provide credit against county real property tax for investment in source abatement.	3	5	6	WGD	Irrigated Ag	FUND	4
13	193	Q193A - Develop farmer-specific irrigation water use programs including collection of data, records of irrigation management, education of farmer regarding new processes and technology.	6	4	4	WGD	Irrigated Ag	IM	18
55	194	Q194A - Create irrigation management plans (similar to nutrient management plans) for farms over a minimum size and provide financial assistance for implemented plans.	6	2	6	WGD	Irrigated Ag	IM	1
30	195	Q195A - Encourage advanced irrigation management. Recognizing that there is significant cost involved in changing an irrigation system, look for strategic opportunities in the area where the use of more advanced irrigation management systems could have the greatest benefit for reducing nitrogen impacts to groundwater. One example of advanced irrigation management is electronic sensor irrigation water management (IWM). Identify federal, state and local incentive programs, such as grants, and low interest loans, to facilitate a transition to more advanced irrigation management in those areas ((EQIP LIKE))	11	0	3	EPA Region 10	Irrigated Ag	IM	7
8	196	Q196A - Provide funding for a mobile irrigation lab to assess the efficiency of current or advised irrigation practices, either through a singular lab or component parts.	5	3	6	WGD	Irrigated Ag	IM	10
28	197	Q197A - Provide financial assistance for 1) conversions from rill irrigation to sprinkler or drip irrigation, 2) installation of flow meters and moisture meters to reflect over-irrigation, high water table, drought conditions, 3) the cost of hiring third party sampling, measuring equipment, personnel or self-test kits, 4) management of sprinkler systems so they do not drive nutrients past the root system.	9	1	4	WGD	Irrigated Ag	IM	8
7	198	Q198A - Establish a voluntary irrigation management cost-share program with SYCD. Data shared with public.	7	5	2	WGD	Irrigated Ag	IM	9
11	199	Q199A - Manage sprinkler systems so they do not drive nutrients past the root system.	8	2	4	WGD	Irrigated Ag	IM	2
14	200	Q200A - Advise farmers of the relative propensity of wheel lines, center pivots, and drip lines to cause leaching.	4	3	6	Literature	Irrigated Ag	IM	3

84	201	Q201A - Use available techniques to determine how much and when irrigation is needed instead of irrigating according to a prearranged schedule.	9	2	3	Literature	Irrigated Ag	IM	4
19	202	Q202A - Schedule water and nitrogen application according to the need for optimal crop yields.	9	1	4	Literature	Irrigated Ag	IM	17
29	203	Q203A - Analyze irrigation practices to discover whether frequency or volume creates greater propensity for leaching.	6	6	2	Literature	Irrigated Ag	IM	5
30	204	Q204A - Identify and decommission abandoned agricultural irrigation wells.	7	2	5	Literature	Irrigated Ag	Abandoned Wells	10
33	205	Q205A - Upgrade irrigation districts' open, earthen or concrete delivery laterals and head ditches to PVC pipe.	4	4	6	Literature	Irrigated Ag	IM	11
36	206	Q206A - Route irrigation-return flow through a constructed managed wetland to reduce concentrations of nutrients and suspended sediment.	3	3	8	Literature	Irrigated Ag	IM	12
40	207	Q207A - Add polyacrylamide (PAM) to irrigation water.	2	6	6	Literature	Irrigated Ag	IM	13
42	208	Q208A - Install effective backflow prevention devices on supply lines of water supplied from groundwater wells to avoid backflow from chemigation.	8	3	3	Literature	Irrigated Ag	IM	14
22	209	Q209A - Structure irrigation water pricing by volume per acre used with preference for lower volume use.	4	6	4	Literature	Irrigated Ag	IM	15
43	210	Q210A - Improve micro-irrigation system design and operation.	7	3	4	Literature	Irrigated Ag	IM	6
2	211	Q211A - Recommend that irrigation districts be authorized to condition delivery of irrigation water on irrigation practices consistent with agronomic rate of application of water.	2	7	5	WGD	Irrigated Ag	IM	16
44	212	Q212A - Require irrigated agriculture nutrient management plans. Record the source and type of fertilizer and number of acres fertilized with each.	8	1	5	WGD	Irrigated Ag	NMP	2.4
13	213	Q213A - Establish water use domains (zones) to apply water use constraints, or well construction design constraints, for agricultural uses.	2	8	4	Literature	Irrigated Ag	Reg - Zon	16
12	214	Q214A - Develop and implement Nutrient Management Plans (NMPs) for all producers (those that apply manure and those that apply synthetic fertilizer that include annual soil testing for phosphorus and nitrogen and which follow available guidance (i.e. Land Grant University) for developing appropriate land application rates for phosphorus and nitrogen. These NMPs can identify site specific conservation practices that are, or will be, implemented to minimize the transport of phosphorus or nitrogen to surface and ground waters. NMPs that are adaptive -- adjusted based on annual soil tests, the types of crops grown, and other site or field specific factors to allow producers to adjust their plans and practices as new information becomes available. Regulatory approach,	8	1	5	EPA Region 10	Irrigated Ag	NMP	2
6	215	Q215A - Provide funding for nutrient management education or information distribution.	8	4	2	WGD	Irrigated Ag	NMP	3
31	216	Q216A - Make Dairy Nutrient Management Plan records available upon Department of Agriculture determination of potential excessive application of nutrients.	6	3	5	Literature	Irrigated Ag	NMP	2.3
69	217	Q217A - Incentivize investment in crops that require less fertilization, or which take up greater amounts of nitrogen.	3	5	6	Literature	Irrigated Ag	NMP	11
30	218	Q218A - Distribute information to farmers on what can happen with applied manure-nitrogen , what should be applied and reasonable, agronomic rates of application.	9	2	3	WGD	Irrigated Ag	NMP	10
65	219	Q219A - Integrate use of animal waste and synthetic fertilizer, balancing nutrient application amounts so as to maximize crop production and full nitrogen uptake.	8	3	3	Literature	Irrigated Ag	NMP	2.2
5	220	Q220A - Track nutrients and their application regardless of the end user, including commercial fertilizer.	5	2	7	L/C WG	Irrigated Ag	NMP	9
38	221	Q221A - Keep track of synthetic fertilizer sales.	5	4	5	WGD	Irrigated Ag	NMP	10
17	222	Q222A - Avoid fertilizer material and manure spills during transport, storage, and application.	4	1	2	WGD	Irrigated Ag	NMP	13
20	223	Q223A - Use effective application schedules, placement, rate and time of application and speed of release for specific crop requirements.	11	1	2	Literature	Irrigated Ag	NMP	1
85	224	Q224A - Where possible, apply nitrogen through to plant-specific root zone means, rather than broadcast application.	8	1	5	Literature	Irrigated Ag	NMP	5
47	225	Q225A - Identify areas with highly permeable and susceptible soils where fertilization and pesticide application should be most carefully managed.	6	3	5	Literature	Irrigated Ag	Reg - Zon	17

86	226	Q226A - Amend Yakima County Code 16C.09.070 to include excess fertilizer application (excess) to list of prohibited uses within critical aquifer recharge areas.	7	4	3	WGD	Irrigated Ag	Reg - Zon	18
71	227	Q227A - Amend the list of prohibited uses under the Critical Aquifer Recharge Area ordinance 16C.09.070 (6) to include activities that would add nutrients to the soil column beyond those amounts that can be taken up within a reasonable time by plant materials. Or perhaps, activities inconsistent with NCRS Code 590	7	6	1	Literature	Irrigated Ag	Reg - Zon	19
33	228	Q228A - Inform farmers that fertilization and supplemental irrigation beyond the optimum rate will not necessarily produce better yields or higher profits without serious side effects.	11	2	1	WGD	Irrigated Ag	ED	11
19	229	Q229A - Develop an approach for data collection of volume and location of manure application off dairy sites. See 182	5	5	4	WGD	Irrigated Ag	DNMP	12
32	230	Q230A - Place area wide limitation on number of acres where manure can be spread as fertilizer. Require permit to spread manure as fertilizer. Allow market in permits. Allow dairies to own permits which could be leased to other agricultural properties.	1	9	4	Literature	Irrigated Ag	Reg - Zon	6
87	231	Q231A - Require soil sampling results and area fertilized from exported dairy manure as a precondition of exportation of dairy nutrients off dairy properties. See #182	5	4	5	WGD	Irrigated Ag	DNMP	11
58	232	Q232A - Regulate synthetic fertilizer and amount of water used if manure application is going to be regulated.	7	4	3	WGD	Irrigated Ag	Regulation	20
55	233	Q233A - Question sellers of synthetic fertilizers in order to learn their objectives, plans, strategies, seeking to discover win/win opportunities.	3	7	4	WGD	Irrigated Ag	Research	22
18	234	Q234A - Require a synthetic fertilizer or other nutrient applicators license (approach taken by pesticides, chemigation and fertigation) as condition to purchase nutrients.	4	3	7	WGD	Irrigated Ag	Regulation	21
24	235	Q235A - Require that prescriptions for soil amendment with organic or inorganic fertilizers be written by certified professionals, and that purchases of inorganic fertilizers limited to those for which prescriptions have been written.	1	6	6	Literature	Irrigated Ag	NMP	6
57	236	Q236A - Establish a safety coefficient limiting application of nitrogen, whether organic (manure) or inorganic (synthetic), to take into account the problem of intervening cause, e.g., change in the weather or water supply that makes the application or the prior application of nitrogen excessive in the event of change in anticipated circumstances.	2	6	6	Literature	Irrigated Ag	NMP	7
17	237	Q237A - Place a small tax on sale of synthetic fertilizer in order to collect volume data.	4	6	4	GWACD	Irrigated Ag	Regulation	22
59	238	Q238A - Subsidize price of alfalfa to induce greater production so as to remove nitrogen from soils.	1	9	3	Literature	Irrigated Ag	FUND	6
46	239	Q239A - Monitor the timing of application of fertilizers to fields and how much water was then applied.	4	6	3	WGD	Irrigated Ag	Research	23
61	240	Q240A - Request Washington Conservation Commission and WSU Extension to dedicate additional funding to Yakima Valley for education and outreach, BMP implementation, irrigation water management, soil nutrient management and manure management and application.	9	1	3	WGD	Irrigated Ag	FUND	5
40	241	Q241A - Monitor changes occurring in agricultural operations because of efficiencies and economics. and evaluate whether those changes positively affect improvement in groundwater quality.	6	4	4	WGD	Irrigated Ag	Research	24
62	242	Q242A - Develop a system that could be used to determine which farmers need assistance in understanding appropriate farming practices--establish a structure of recommendations establishing clear expectations, list problematic management practices, encourage voluntary compliance, develop peer encouragement system	6	4	4	WGD	Irrigated Ag	ED	19
29	243	Q243A - Investigate use of bio-char in lieu of nitrogen fertilizers	2	6	6	GWACD	Irrigated Ag	Research	25
25	244	Q244A - Recommend against farming around a water well.	6	5	3		Irrigated Ag	Well	2
31	245	Q245A - Intermittent fallowing (leaving lands dormant) to reduce both natural plant nitrogen and fertilizer nitrogen additions to the soil.	2	5	7	Literature	Irrigated Ag	Treat	5

4	246	Q246A - Refrain from tilling under herbaceous remnants of prior crops, reducing plant nitrogen contributions to soil column. BMP	2	5	7	Literature	Irrigated Ag	Treat	6
5	247	Q247A - Consider costs of health risks to families from nitrate exposures, costs incurred by growers and producers of various recommendations, costs of bottled water, costs to connect to public water or sewer systems, cost for WSDA to monitor DNMP, costs of soil sampling	5	4	5	WGD	No Action	z - no action	1
60	248	248 - Require WSDA to establish a monitoring system for compliance with NRCS Standard 317 Composting Facility on Washington dairies and to penalize operations that do not comply with this standard. For new compost facilities, phase in for existing				Jean Medoza	WSDA	Atmosphere	1
12	248	Q248A - WSDA/DNMP will complete Technical Note 23 inspections on all Waste Storage Ponds (lagoons) in the GWMA boundaries.	7	1	5			DNMP	8
15	249	249 - Enforce RCW 70.95.020, RCW 70.95.100, RCW 70.95.160, RCW 70.95.165, RCW 70.95.179, RCW 70.95.180, RCW 70.95.185, RCW 70.95.200, RCW 70.95.205, RCW 70.95.240, RCW 70.95.280, RCW 70.95.285, RCW 70.95.290, RCW 70.95.300, RCW 70.95.305, RCW 70.95.306, RCW 70.95.310, and RCW 70.95.315 (Note - RCW Chapter 70.95 is titled "Solid Waste Management - Reduction and Recycling")				Jean Medoza	Atmosphere	Atmosphere	2
17	250	250 - Enforce WAC 173-350-010, WAC 173-350-040, WAC 173-350-200, WAC 173-350-220, WAC 173-350-225, WAC 173-350-230, WAC 173-350-320, WAC 173-350-330, WAC 173-350-500, WAC 173-350-700, WAC 173-350-710, and WAC 173-350-715 (Note - WAC Chapter 173-350 is titled "Solid Waste Handling Standards")				Jean Medoza	Atmosphere	Atmosphere	3
17	251	251 - Require WSDA to establish an air monitoring system for compliance with NRCS Standard 370 Atmospheric Resource Quality Management on Washington farms and to educate operations that do not comply with this standard.				Jean Medoza	Atmosphere	Atmosphere	4
22	252	252 - Require WSDA to establish an air monitoring system for compliance with NRCS Standard 590 Nutrient Management and NRCS Standard 317 Composting Facility on Washington dairy farms and to penalize operations that do not comply with these standards. Add to #251				Jean Medoza	Atmosphere	Atmosphere	5
53	253	253 - Establish a plan for monitoring emissions of reactive nitrogen to the atmosphere in the GWMA target area. Combine this with models such as the USGS SPARROW model and the National Atmospheric Deposition Program's Ammonia Monitoring Network to provide ongoing measurement of nitrogen volatilization.				Jean Medoza	Atmosphere	Atmosphere	6
58	254	254 - Encourage prompt incorporation of manures and fertilizers after application to cropland where appropriate				Jean Medoza	Atmosphere	Atmosphere	7
63	255	255 - Discourage broadcast application of manures to cropland				Jean Medoza	Atmosphere	Atmosphere	8
19	256	256 - Encourage application of manures and fertilizers by surface banding				Jean Medoza	Atmosphere	Atmosphere	9
20	257	257 - Enforce RCW 70.94.011, 70.94.040, RCW 70.94.141, RCW 70.94.151, RCW 70.94.152, RCW 70.94.153, RCW 70.94.154, RCW 70.94.161, RCW 70.94.181, RCW 70.94.331, RCW 70.94.380 (Note - RCW Chapter 70.94 is titled "Washington Clean Air Act")				Jean Medoza	Atmosphere	Atmosphere	10
1	258	258 - Enforce WAC 173-442-030, WAC 173-442-040, WAC 173-442-050, WAC 173-442-060, WAC 173-442-070, WAC 173-442-160, WAC 173-442-170, WAC 173-442-200, WAC 173-442-210, and WAC 173-442-220 (Note - WAC Chapter 173-442 is titled "Clean Air Rule")				Jean Medoza	DOE	Atmosphere	11
		Q259A - Increase dedicated Provide funding that requires Ecology to gather data, evaluate, and address the environmental impact of intensive, industrial agriculture				Jean Medoza	Research / Data Collection	NMP	
		Require biannual pressure testing of underground pipes that transport liquid manure – using either with cameras or pressure tested, and require repairs if they are not intact.				EPA Div 10	Livestock	Regulation	

Consistent with the NRCS' general recommendation, the use of lagoons should be avoided in watersheds with drinking water aquifers. Any new or existing lagoons in watersheds with drinking water aquifers should be equipped with engineered liners with a flexible membrane liner (FML) and a leak detection system.	EPA Div 10	Livestock	Regulation
If there are drinking water wells that have had a comprehensive site assessment and exceed the Maximum Contaminant Level (MCL) for nitrate, investigate the cause and consider sampling additional wells or use of groundwater monitoring wells, upgradient and downgradient, to assess the source of the nitrate.	EPA Div 10	Livestock	Regulation