Benton County Water Conservancy Board
Information Memorandum

Distribution: FAX and E-mail

DATE: December 10, 2004

TO: Mr. Keith Phillips/Dan Haller, WADOE

FROM: Darryll Olsen, Ph.D., Chairman, BCWCB
Henry Johnson, Chairman, FCWCB

SUBJECT: Water Boards' Response to WADOE's "Determining Irrigation Efficiency and Consumptive Use" Draft Document.

The BCWCB/FCWCB provide the following reply and comments to WADOE regarding the "Determining Irrigation Efficiency and Consumptive Use" Draft Document."

First, the BCWCB/FCWCB reply and comments incorporate: 1) the Water Board's memorandum and attached chart; and 2) the letters provided to the Water Boards by the litigation workshop facilitator (IRZ Consulting) and by the Franklin Conservation District (see attachments).

Second, the BCWCB/FCWECB reply and comments noted below focus on: 1) the future methodology to calculate beneficial and consumptive water use, to be employed by the Water Boards; and 2) other comments to WADOE regarding their draft document.

<u>The Water Boards' approach to calculating beneficial use and ACQ available for change/transfer under RCW 90.03.380 will remain largely the same as previously employed, but using the "new" efficiency rates reached through consensus at the litigation work shop.</u>

1) As recommended by the litigation workshop facilitator (IRZ Consulting), the Water Boards will use the Washington Irrigation Guide (ET/irrigation requirements) and the efficiency rates (minus return flows) derived from the litigation workshop to calculate consumptive water use available for change/transfer (the attached chart illustrates this procedure).

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2) The Water Boards perceive the use of the Washington Irrigation Guide as establishing the best estimation tool relative to the legislative intentions of RCW 90.03.380, taking into account seasonal variations in water use. Baseline estimates of water use should be able to grow the subject crops under production, regardless of seasonal variations.

3) While other water use estimates will be reviewed—meter data, flow and time data, and/or kWh conversions—the Washington Irrigation Guide/efficiencies (WIG-E), minus return flows, approach will prevail, unless compelling site-specific conditions warrant otherwise.

4) For example, if metered data exist and such data are moderately higher than the Washington Irrigation Guide-efficiency (WIG-E) estimates, the Water Boards will use the IG-E estimates. In turn, if the metered data are less than the WIG-E estimates, the Water Boards will use the WIG-E estimates. Consistency will prevail, thus establishing equity and minimizing error.[1]

More specific BCWCB/FCWCB comments on the WADOE draft document follow, highlighting some key points.

1) As a general observation, it is clear that the WADOE "guidance document" is equivalent to an agency rule, both in form and substance. It is a de facto rule, and the Water Boards recognize it as such. For the Water Boards, the pragmatic issue is whether it is an acceptable rule, regardless of legal authority.

2) As a general observation, the Water Boards perceive the "new" irrigation efficiency rates, minus return flows, as the high end of the empirical scale. The rates presented by the litigation workshop facilitator (IRZ Consulting) are probably more realistic.

3) The Water Boards note that some of the efficiency values used in the WADOE table are not the same values reflecting general agreement by the workshop panel—the side-roll and solid set numbers are incorrect, as presented.

4) The Water Boards do not agree with the presentation of return flows provided in Table 1 of the WADOE document. The return flow numbers presented in Table 1 were not review or discussed by the litigation conference participants, and several of the participants emphasized that return flows are extremely difficult to measure and deep percolation is usually not return flows for pressurized irrigation systems.

5) The Water Boards do not agree with WADOE staff that any water designated as "return flow" is timeless relative to actually returning to a defined body of water for reuse. This interpretation is inconsistent with statutory intent accepted

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[1] The Water Boards and others have previously noted to the WADOE that metered data is not "exact," and usually contains errors of plus or minus 5-15% depending on conditions. The same holds true for kWh to water use conversion estimates.

industry practice. In the real world, time does matter. "Return flows" must be capable of reuse within a reasonable time frame, and applicable to empirical measurement.

6) The Water Boards do not fully agree with the examples provided on pages 10-11 of the WADOE document, as to the application of the new efficiencies or the data sources employed by WADOE—given the consensus of the workshop panel and the observations/recommendations of the workshop facilitator (IRZ consulting).

7) As a general observation, the WADOE is advised to keep their calculation approach (rule) simple. As we have stated previously, the ACQ methodology should not feign accuracy under a veil of complexity--given the subject matter and range of error(s) we are reviewing.

Attachments: 1) BCWCB ACQ Chart.
2) IRZ Letter
3) Franklin Conservation District Letter

IRZ CONSULTING, LLC
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December 10, 2004

Darryll Olsen, Ph.D., Chairman
Benton County Water Conservancy Board
Kennewick, WA

Keith E. Phillips
Assistant to the Director
Department of Ecology
P.O. Box 47600
Olympia, WA 98504-7600

Re. Results of the November 29-30, 2004 Workshop sponsored by DOE and Recommendation to the Water Conservancy Boards

Dr. Olsen and Mr. Phillips:

I have reviewed the paper entitled 'Determining Irrigation Efficiency and Consumptive Use' prepared by DOE as reflecting the discussions and conclusions of the November 29-30, 2004 workshop.

As litigation workshop facilitator, I have prepared IRZ's summary of the key focus of the workshop, the revised efficiency rate table for application to various irrigation technologies. IRZ recommends that the Water Boards use these efficiency rates to calculate water right consumptive use. An appropriate application is discussed in the attached summary as well.

IRZ also has responded to some of the points raised in DOE's draft document. We have corrected some of the efficiency numbers in the DOE table that do not reflect the final consensus of the workshop panel, and I must emphasize that it is not correct to assign water use greater than that calculated with the Irrigation Guide and efficiency rates as simply return flows.

I am available to respond to any additional questions, per your inquiry.

Sincerely,

[Signed}

Fred Zairi, CEO IRZ Consulting, LLC

(1) For the purpose of characterizing various methods of irrigation it was agreed that the ranges and averages of application efficiencies indicated in a paper prepared by Dr. Terry A. Howell were the current best numbers. For the purpose of determining the Annual Consumptive Quantity (ACQ), another efficiency was discussed, the Consumptive Use Efficiency (CU Eff). All of these efficiencies are present in Table 1. The CU Efficiency accounts for applied water that, through one form or another, is lost in the atmosphere. Dividing the annual beneficial use for a given cropping pattern by the appropriate CU Efficiency gives the reasonable annual consumptive quantity for a given method of irrigation. This is the only calculation that is required to determine the necessary and appropriate water duty meeting the statutory needs of the Water Boards and Ecology.

Table 1: Summary of Application Efficiency Ranges and Averages and Consumptive Use Efficiency for Various Irrigation Methods.

Method		Application Efficiency, Ea (%)[1]		Consumptive Use Efficiency CU Eff (%)[2]
		Range	Average	
Surface:	Graded Furrow	50 – 80	65	**95**
	w/ tailwater reuse	60 – 90	75	**95**
	Level Furrow	65 – 95	80	**95**
	Graded Border	50 – 80	65	**95**
	Level Basins	80 – 95	85	**95**
	Flood	*35 – 60*	*50*	95
Sprinkler:	Periodic Move (Handline)	60 – 85	75	**85**
	Side Roll (Wheel-line)	60 – 85	75	**85**
	Moving Big Gun	55 – 75	65	90
	Solid-Set – Overtree	*55 – 80*	*70*	85
	Solid-Set – Undertree	*60 – 85*	*75*	90
Center Pivot:	Impact heads w/end gun	75 – 90	80	**85**
	Spray heads wo/ end gun	75 – 95	90	**90**
	LEPA wo/ end gun	80 – 98	92	**95**
Lateral-Move:	Spray heads w/hose feed	75 – 95	90	90
	Spray heads w/canal feed	70 – 95	85	90
Microirrigation:	Trickle/Drip	70 – 95	88	**95**
	Subsurface Drip	75 – 95	90	100
	Microspray	70 – 95	85	**90**

1. Application Efficiency Ranges and Averages taken from a paper authored by Dr. Terry A. Howell with the exception of those for the methods of flood and solid-set.

2. Consumptive Use Efficiency is the efficiency term agreed to be used to calculate ACQ. Most discussion and agreement focused on center pivot systems.

(2) There was considerable discussion concerning appropriate and reasonable CU Efficiencies for various methods of irrigation. Most of this discussion focused on center pivot irrigation. The most complete real world data about CU Efficiencies for center pivot irrigation was provided by IRZ Consulting, LLC. One source of information was weekly data on the water applied and the water reaching the ground surface for twenty-five center pivots collected throughout a season. For nine onion pivots and eight potato pivots, where the sprays were five to six feet above the ground, the average resulting efficiency was 85%. For eight corn pivots, where the sprays were nine to ten feet above the ground, the average resulting efficiency was 81%. Another source of information was the general understanding resulting from twenty years of irrigation scheduling data on hundreds of center pivots. The basic conclusion of this extensive experience is that if an efficiency higher than 85% is used to estimate irrigation application requirements the result is under irrigation.

The other pertinent information provided by IRZ Consulting, LLC was the extensive soil moisture data collected weekly at hundreds of sites. This data indicates that under properly managed irrigation there is little opportunity for the downward movement of water below the crop root zone.

(3) **Additional Responses**

- There should be one accepted and agreed to standard for the determination of reasonable beneficial use requirements. For the ET portion of this use requirement, the Washington Irrigation Guide would seem to be the most appropriate in that it provides complete coverage of Washington State based on a consistent methodology.

- If there is a question about the use of the Washington Irrigation Guide data for a given site it should be the USDA-NRCS personnel responsible for the guide that resolves the issues.

- As acknowledged by DOE (Dan Haller) during the workshop, reasonable beneficial use requirements can include irrigations that occur prior to crop emergence and after harvest. These considerations would require site by site investigation while accounting for regionally accepted cultural practices.

- Data obtained from flow metering should not be considered as more accurate. Even with the best equipment, there can be considerable inaccuracy resulting from improper installation and/or calibration. Even if perfectly accurate flow data were available it should not change the basic analysis. If the measured total flow volume were less than the ACQ for a given year, resulting from a particular set of management decisions, it still would have been reasonable to have taken the full ACQ. If the measured total flow volume were greater than the ACQ it doesn't matter where the excess application ended up, only the ACQ can be moved. The only calculation that is necessary is:

  Annual Consumptive Quantity = Total Beneficial Use / CU Efficiency

- Not all "excess" water application will become return flow.

Franklin County WA

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Pasco,WA 99301
Ph. (509) 545-8546 Ext. 3 FAX (509) 547-2007

December 9, 2004

Dr. Darrell Olsen
Benton County Water Conservancy Board, Chair
R. Henry Johnson
Franklin County Water Conservancy Board, Chair

Dear Dr. Olsen and Mr. Johnson,

This letter is in response to the draft guidance document (GUID-1210) issued by Ecology after the irrigation efficiencies workshop held on November 29-30, 2004. I concur with the majority of the document. However, I must reiterate my concerns regarding Ecology's estimate of the amount of deep percolation and runoff that are deemed return flows. Table 1 of GUID-1210 essentially tries to summarize the work conducted at the conference. Those participating agreed upon columns 1 – 4 of Table 1. I do not believe there was agreement on Column 5. These values were not presented at the workshop. Making the assumption that all deep percolation and runoff that occurs during an irrigation event eventually return to the waters of the state is erroneous and not protective of the environment. As a natural resource professional with nearly 20 years of experience in irrigation and its impact on the environment I believe the above assumption to be incorrect.

Based on the following information, it is my opinion that measuring or calculating deep percolation losses which ultimately result in return flows to an aquifer or stream is currently not a practical effort. It is my opinion that under a well managed sprinkler irrigation system there is virtually no return flows. While a potential return flow calculation is possible, the accuracy of the assumptions which must be made is extremely suspect. Therefore, any value calculated has such a high margin of error that it makes the calculation meaningless. Our basic assumption is that return flows from a sprinkler irrigation system may only occur when the net water application is above and beyond the crop water requirement after irrigation efficiencies are discounted.

<u>Background</u>

The Franklin Conservation District (FCD) has been involved with the prevention of ground water contamination for the last 20 years. Our major role has been to assist the agricultural community to implement programs which prevent the leaching and deep percolation of water and nitrate into the ground water system from irrigated farm land.

Measuring Deep Percolation

Our experience has shown that physically measuring deep percolation losses is extremely difficult. We have experimented with a variety of instruments including passive capillary lysimeters, suction lysimeters, and other such devices. The search for a device with even a modicum of accuracy has become the "Holy Grail". The measurement of this parameter is not an easy task. Other agencies and individuals charged with like efforts have met with a similar fate. Indeed, the Department of Ecology's Water Quality section when working with permitted facilities that use agricultural land to dispose of waste water now use surrogate methods as opposed to a physical measuring device. Ecology's goal in this effort is to prove that permitted facilities are not creating deep percolation with the sprinkler application of waste water.

Calculating Deep Percolation

It is difficult to calculate deep percolation and return flows when all the variables are included in the estimate. A simple method using the statistics surrounding the Distribution Uniformity of the Low ¼ or other uniformity coefficients is flawed for the following reasons.

1). The soil of the effective root zone has a field capacity. A simple approach assumes if irrigation or rainfall beyond that level occurs it will become deep percolation. However, normally it takes a significant amount of time for excess water to move through the root zone. It will take longer in finer soils or with deeper root zones. As this excess water is moving through the root zone it is available for the plant to use. Thus, in effect, normal depletion of soil water will be delayed as excess water works its way through the root zone.[1]

2). Gravity is not the only factor which controls water movement in the soil. If an area in a field becomes saturated due to a specific irrigation it does not mean the water in that area will automatically flow vertically and become return flow. Water flow in the soil is largely controlled by the matrix potential or tension of the soil. Dry soil has high tension. Water moves from low to high tension areas by capillary action. Therefore, water moves laterally and even upward if there is a tension gradient between two adjacent soil masses. Lateral movement of water is the basis behind furrow and drip irrigation. With these irrigation systems water is applied to a furrow or point and the water is required to move laterally to wet the entire root system. The same lateral movement is also true for sprinkler irrigation systems. If a soil area receives a higher amount of water than a neighboring area then a tension gradient is created and lateral movement occurs. Surface tension created by soil particles and the effect of the adhesive and cohesive properties of water allow soils the ability to hold water with a greater force than gravity.

3). Water from a sprinkler irrigation system does not land on the exact same spot in the field during every irrigation rotation or set. An area which receives copious amounts of water during a one irrigation cycle may be under-watered during the next cycle. Wind, pressure changes, and other variables all contribute to the variability of irrigation application between individual irrigations.

4). Deep rooted crops planted following shallow rooted crops scavenge both fertilizer and water that has escaped past the shallow rooted crops but is now stored in the deeper soil profile. Crop rotations with deep rooted crops is a common strategy for water quality protection to prevent nitrate leaching into the ground water system. Irrigation which has escaped one crop may be utilized by the successive crop in the cropping rotation.

5). The FCD has settled on a method to calculate deep percolation and the potential for recharge which includes the assumption that return flows from a sprinkler irrigation system only occur when the net water application is above and beyond the crop water requirement after irrigation efficiencies are discounted. Until new technology is developed that will directly measure deep percolation, this is the only method technically justifiable.

<u>Fate of Runoff from Sprinkler Irrigation</u>

Recapture and reuse systems are typically employed in surface irrigation systems. This is not true for the majority of sprinkler irrigation systems. The fate of runoff from sprinkler irrigation is typically not well managed because the efforts in this area tend to focus on eliminating runoff. Runoff may ultimately result in one of the following:

1). Deep percolation.
2). Return flow directly to a surface water body.
3). Consumption by non-target weeds or native plants.
4). Direct evaporation to the atmosphere.

In the Columbia Basin it is my estimation that consumption by non-target weeds or native plants represents the largest consumption of runoff. Deep percolation from ponded areas could also be significant. Return flow directly to a surface water body and direct evaporation to the atmosphere would be minor considerations. The ability to calculate the amount of runoff that resulted in actual return flows to waters of the State would be difficult, site specific, and would vary from each runoff event. All we can say from a generic standpoint is that only a portion of runoff returns to waters of the State.

<u>Excerpts from Irrigation Publications</u>

"The water budget equation does not provide a factor for runoff as good irrigation management practices should eliminate runoff. Deep percolation (DP) is also assumed to be zero in most cases as it is difficult to measure and should be minimal if good irrigation practices are followed."[2]

"Properly designed and managed sprinkle irrigation systems should not produce runoff or deep percolation. Therefore, the key to minimizing such losses is proper management.[3]

"**Deep percolation – that isn't** – As noted, the soil of the effective root zone has a field capacity. If irrigation or rainfall infiltrates beyond that level it will become deep percolation – or will it? Normally it takes a significant amount of time for excess water to move through the root zone. It will take longer in finer soils or with deeper root zones. As this excess water is moving through the root zone it is available for the plant to use. Thus, in effect, normal depletion of soil water will be delayed as excess water works its way through the root zone. [1]

Based on the above information I would like to reiterate the following:

- Measuring or calculating deep percolation losses which ultimately result in return flows to an aquifer or stream is currently not a practical effort.
- Under a well-managed sprinkler irrigation system there is virtually no return flows (either deep percolation or runoff).
- Any calculated value for return flow has such a high margin of error that it makes the calculation suspect.
- Our basic assumption is that return flows from a sprinkler irrigation system only occur when the net water application applied is above and beyond the crop water requirement after irrigation efficiencies are discounted.

Sincerely,

Mark T. Nielson
District Manager

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[1] "THE FINER POINTS OF WATER BUDGET IRRIGATION SCHEDULING", Wateright.Org Website, http://www.wateright.org/site2/advisories/sched1.asp
[2] WATER CONSERVATION FACTSHEET, Order No. 577.100-3, Revised May 2004, Agdex: 561, British Columbia Ministry of Agriculture, Food and Fisheries.
[3] United States Department of Agriculture, National Engineering Handbook Part 623, Chapter 2: Irrigation Water Requirements, September 1993.

Benton County
Water Conservancy Board

DISTRIBUTION: FAX and Mail

DATE: June 27, 2005

TO: Mr. Joe Stohr, Water Resources Program, WADOE
and Distribution List

FROM: Darryll Olsen, Ph.D., Chairman, BCWCB

SUBJECT: Your Letter to Mr. Fred Ziari, IRZ Consulting, Hermiston, Oregon

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Distribution:

Mr. Fred Ziari, IRZ Consulting, Hermiston, Oregon
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Eastern WA Legislators
Benton County Commission
Franklin County Commission
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Interested Parties

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Benton County
Water Conservancy Board

DATE: June 27, 2005

TO: Mr. Joe Stohr, Water Resources Program, WADOE
and Distribution List

FROM: Darryll Olsen, Ph.D., Chairman, BCWCB

SUBJECT: Your Letter to Mr. Fred Ziari, IRZ Consulting, Hermiston, Oregon

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"TWO AND TWO MAKE FIVE"

> *"Day by day and almost minute by minute the past was brought up to date…nor was any item of news, or any expression of opinion, which conflicted with the needs of moment, ever allowed to remain on record. All history was a palimpsest, scraped clean and reinscribed exactly as often as was necessary."*
>
> *"Who controls the past, controls the future: who controls the present, controls the past."*

-- From the Ministry of Truth
George Orwell's *1984*

I have been forwarded a copy of Joe Stohr's (Yakima WADOE staff) recent letter to Fred Ziari, concerning the Conservancy Boards/WADOE litigation workshop, where he facilitated per Keith Phillips' initial suggestion, and which I supported.

First, for the record and for concise reference within any future litigation hearings, the statement attributed to me in the letter is false, much of what is expressed in the letter is a highly distorted portrayal of events at last year's litigation workshop, the letter reflects a deranged attempt to reconstruct the past, and the letter's derogatory tone toward Mr. Ziari is a clear attempt to invoke intimidation.

Second, the intent underlying this letter is disingenuous, as by definition alone those seeking to alter the past through manipulative, revisionist history embrace maliciousness.

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In the sad future world feared by George Orwell, a corrupted bureaucracy sealed its control over citizens by forcing them to acknowledge that "two and two make five," an action not substantively unlike WADOE's attempt to force partial relinquishment of water rights through its own version of mathematical reality. While the WADOE staff involved here cannot match the sophistication of Orwell's Ministry of Truth, they do convey the same corrupting lust for power and control to enforce their "internal policy."

And apparently service to their "policy"—not state law or formal agency rule—requires that history must be rewritten, in order to alter both the past and present.

Third, as one participant of the litigation workshop stated to me, Joe Stohr's attack on Mr. Ziari's integrity and service as litigation workshop facilitator has occurred, because the WADOE Yakima Office staff were publicly embarrassed by their own questionable actions leading to the litigation workshop, and at the workshop, "they did not get what they wanted." The workshop principals were not willing to concede that "two and two make five."

Mr. Ziari possesses a comprehensive technical knowledge of the points reviewed at the workshop, and his water management competence is respected throughout Eastern Washington and Eastern Oregon. But of greater significance relative to Joe Stohr's letter, Mr. Ziari has an unmatched reputation for honesty and working collaboratively with all parties, even the chronically dishonest. Joe Stohr's shameful attempt to disgrace Mr. Ziari does not represent the best interests of either Eastern Washington or Eastern Oregon citizens.

The Yakima Office staff involved here are not worthy to wipe the dust from Mr. Ziari's shoes.

Finally, as I have previously stated concerning the litigation workshop, from start to finish, the actions by some agency staff have reflected the worst behavior any government agency can bestow on its citizens.

Joe Stohr's letter only provides further justification for this conclusion.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47600 • Olympia, WA 98504-7600 • 360-407-6000
TTY 711 or 800-833-6388 (For the Speech or Hearing Impaired)

May 31, 2005

Fred Ziari
IRZ Consulting, LLC
505 East Main
Hermiston, OR 97838

RE: Draft GUID 1210 *Determining Irrigation Efficiency and Consumptive Use*

Dear Mr. Ziari:

The purpose of this letter is to convey Ecology's concerns regarding your facilitation of the recent irrigation expert's workshop, and to respond to comments raised in your December 10, 2004 letter regarding the first draft of the subject guidance document.

1. You were initially identified as a potential expert selected to represent the Benton and Franklin County Water Conservancy Boards. Subsequently, Dr. Olsen recommended you as the facilitator assuring Ecology that you could serve as a neutral facilitator for the forum. You assured Keith Phillips that as facilitator you would not advocate for any one position. We were then subsequently surprised to learn in Dr. Olsen's opening statement to the assembled professionals that you had already agreed to prepare a technical memorandum based on the Boards' conclusions from the conference, which is inconsistent with the role of neutral facilitator. It was further our experience that:

    a. At the forum, you repeatedly attempted to steer the discussion towards center-pivots, as requested by the Benton and Franklin Boards. However, Ecology routinely encounters many other common types of surface and sprinkler systems, This behavior continued even after Ecology's expert suggested this was unacceptable

    b. You attributed consensus positions to the panel that were not reached, especially on the issue of return flows. At the conclusion of the conference, despite rigorous debate in the closing minutes on the consumptive use values being considered for overtree, undertree and periodic move sprinklers, you indicated that consensus had been reached. This incorrect characterization is carried forward in your letter. Ecology feels that the conference was a success and consensus was reached on numerous issues. However, suggesting that the remaining issues had been resolved in the Boards' favor is incorrect.

c. Despite the fact that Dr. Wattenburger represented IRZ on the panel of experts, you often took the opportunity to opine on IRZ's experiences with irrigation systems. This was not your role as facilitator despite your association with IRZ, but rather that of Dr. Wattenburger.

d. Although you were hired to serve as facilitator, you opined on disputed issues surrounding return flows, and routinely characterized return flows as small and nearly impossible to calculate despite substantial testimony that each system should be evaluated on a case-by-case basis, because presence or absence of return flows is heavily influenced by management practices.

2. Your letter incorrectly states that "the most complete real world data about CU Efficiencies for center pivot irrigation was provided by IRZ Consulting, LLC". Ecology assembled a workbook of relevant literature including evaluations of center-pivot systems and provided it to the experts in advance. You and the Boards were invited to include relevant information and chose not to. Instead, you brought numerous graphs and spreadsheets and attested to their authenticity and under what conditions the data was collected. Both Ecology and the other experts expressed concern with this approach during the conference.

3. Your position advocating rejection of metering data in favor of theoretical crop irrigation requirements is inconsistent with the water code.

   "*Even if perfectly accurate flow data were available it should not change the basic analysis. If the measured total flow volume were less than the ACQ for a given year, resulting from a particular set of management decisions, it still would have been reasonable to have taken the full ACQ*" (Page 3, IRZ Letter dated December 10, 2004).

   The measure of a water right is beneficial use and Ecology will utilize actual water use data whenever it is available, along with all other pertinent information to quantify use under a right.

If you have any questions or concerns on the above information, please contact me at the Department of Ecology at (360) 407-6604.

Sincerely,

Joe Stohr, Manager
Water Resources Program

IRZ Consulting, LLC

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Hermiston, Oregon 97838

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Web: www.irz.com

June 15, 2005

Washington Department of Ecology
Mr. Joe Stohr
Manager, Water Resources Program
P.O.Box 47600
Olympia, WA 98504-7600

Re: Draft GUID 1210 Determining Irrigation Efficiency and Consumptive Use

Dear Mr. Stohr:

I received your letter dated May 31, 2005. One word can express my feeling and total shock when reading your letter. WOW! Are you guys for real!

Your letter is so out of line and so disrespectful, that I first thought it did not even deserve a response. However to clear your misconceptions, I decided to write this letter.

Background: Sometime during the fall of 2004 I was contacted by Mr. Keith Phillips of DOE and asked if I can facilitate an irrigation efficiency workshop with irrigation experts from across the country.

I understood that this facilitation was to reach an agreement so that a court battle between WDOE and Benton/Franklin Conservation District could be avoided. The workshop was held in Pasco Washington on November 29th and 30th 2004.

I personally knew most of the irrigation experts on the panel, some for over 20 years. Per instructions from Mr. Phillips, I called the experts ahead of time and asked them to prepare materials and be ready to discuss the irrigation efficiency and other issues at hand so that we could help the parties reach consensus.

Who are we: Since I never met you (which makes your letter even stranger) I would like to give you some background of where I am coming from.

I was born and raised in a very successful farming family. I received my undergraduate and graduate degrees in agricultural engineering from Texas A&M University. In the late 1970's I was hired by the WSU Agricultural Engineering Department and involved in early research and implementation of irrigation/water management practices in the Columbia Basin of Washington State. In the early 80's I joined an electrical utility company in Eastern Oregon as an irrigation specialist. While there I developed one of the largest water and energy conservation programs in the Pacific Northwest. In 1982 I worked with the Bonneville Power Administration and the US Bureau of Reclamation to install the first automated satellite based weather station network in Eastern Oregon in order to promote irrigation scheduling in the Pacific Northwest. This later became known as Agri-Met. In 1983, I developed the first on-line irrigation network known as the Northwest Irrigation Network (www.irz.com/nin). This network which is the oldest ongoing irrigation network in the US, is serving hundreds of thousands of irrigated acreage in eastern Washington and Oregon as well as the rest of the Northwest.

In 1984, I founded IRZ Consulting (www.irz.com) to provide integrated irrigation consulting services, including irrigation engineering, water and energy conservation, remote sensing and other related services. To-date, IRZ Consulting has conducted over 2,000 irrigation design and efficiency evaluations (I am not so sure any of your so called DOE experts have even done 2 design) throughout the Pacific Northwest and the US. Our irrigation scheduling, soil moisture monitoring and water management programs annually serve over 400,000 acres of irrigated farms in eastern Washington and eastern Oregon alone. We are the largest private provider of water conservation services in the western US.

I have been inducted into the Oregon State University agricultural hall of fame, received the Ag-Star award, received the Energy Innovation award from US Secretary of Energy, and Governor of Oregon, named Engineer of the Year by the Pacific-Northwest Society of Agricultural Engineering, named Business Man of the Year in Hermiston, and named the Man of the Year in Hermiston among many other awards that I have been blessed to be honored with. I spent all of my professional life developing and implementing technologies to conserve our water resources and will continue to do so.

I am not a professional facilitator, and never was!!! I was asked to help and I did. I have always prided myself as, and recognized by my peers and clients to be, a very professional and fair-minded person with all that I come in contact with. If your problem with me was that you thought I am only a facilitator that has no opinion on the subject of irrigation, then somebody gave you a wrong perception of who I am. This attempt to marginalize my expertise is not acceptable. After talking at length with Mr. Phillips, and Mr. Olsen and all other panel experts, my only goal was to try to get everyone to be on the same page, to reach consensus, then move on. After two days of open discussions, **EVERBODY** and I mean **EVERBODY** in the panel of experts agreed on a set of efficiency standards, developed by Dr. Terry Howel of Texas. We prepared this efficiency table during the facilitation meeting and not, as you wrongfully allege, beforehand. As a matter of fact Dan Haller of DOE was the one that showed us the table.

You allege that I routinely steered the discussion toward center pivots, and that I was told by DOE this was not acceptable. This never happened and it is a flat ***untruth***. The reason that we discussed center pivots more was, as I understood it, was that this was the question at hand (i.e. Bento-Franklin Board vs. DOE litigation avoidance). Most farms in Benton/Franklin use mainly center pivots. We agreed and recognized that there are all different types of irrigation systems, which was evident with its quick (very little opposition) adaptation of efficiency standards proposed by Howel. During every break in the two day meeting, I consulted with Mr. Phillips and sought his advice as how he thought it was going. I was assured he felt very good about the meeting and the direction it was heading. This is very contrary to your allegation. At one point Mr. Phillips even suggested to me that we should agree to an 85% efficiency and no return-flow for center pivots. Subsequently, however, we settled on a much higher efficiency standard of 90%.

Your statement that we advocated to reject metering is ridiculous. All my professional life I have promoted and designed metering, instrumentation and measurement as the basis of good water management practice. What we've agreed on was one method that did not require metering. You can develop a different method that uses metering, or both.

I am still not sure what your motivation in writing such an inflammatory, nonsensical, and untruthful letter was. Especially surprising is the fact that it came out of nowhere some 7 months after the fact.

In the entire quarter century of my professional career this is the most embarrassing letter I've ever received. We did a great service to the WDOE by bringing people to an agreement on a set of standards, based on the most recent scientific data. You should be celebrating this as a victory and a big WIN by bringing DOE, professionals and stakeholders together at the same table to reach an agreement (which we did). This is always preferable to litigation. But alas, it seems that even in victory you can not celebrate.

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