

**FINAL**  
**Meeting Summary**  
**WRIA 54 - Lower Spokane River Watershed**  
**November 14, 2006**

**Location:** Airway Heights Community Center, Airway Heights, WA.

**Planning Unit members and guests recorded on the sign-in sheet were:**

Lloyd Brewer, City of Spokane	Rob Lindsay, Spokane County
Mimi Wainwright, WA State Dept. of Ecology	Bill Gilmour, Spokane County
Dick Price, Stevens PUD	Jim DeGraffenreid, Lincoln County Planning
Kay Rowley, Powderhorn Bay Water Assoc.	Bob Derkey, WA State Dept. of Natural Resources
Jerry Warner, Palisades Neighborhood	Craig Volosing, Landowner
Jay Landreth, Landowner	Stan Miller, Citizen
Judy Kaufman, Spokane Flyfishers	Charlie Peterson, Spokane County Conservation District
Bruce Smith, Landowner	Rex Harder, Landowner in WRIA 34
Courtney Harder, Landowner in WRIA 34	Dr. Bob Quinn, Eastern Washington University
Cynthia Carlstad, Tetra Tech/KCM	Bryony Stasney, Golder Associates Inc.
David Luders, Fairchild Airforce Base and Indian Village Estates Water Assoc.	
Jeanne Barnes, Spokane Association of Realtors and Lake Spokane Park Homeowners Association	

**Call to Order**

Bryony opened the meeting at 10 am. Those in attendance introduced themselves. Bryony requested that each attendee complete the sign-in sheet.

**Review of October 2006 Meeting Summary**

The draft October 25, 2006 WRIA 54 Planning Unit meeting summary was reviewed page by page with no requests for changes. The summary was accepted by those present as final and will be posted on the County's web site at <http://www.spokanecounty.org/wqmp/wria54.htm>.

**Public Comment**

Rob Lindsay informed the group that he had spoken with Rex Harder of the Palouse watershed group (WRIA 34) regarding watershed planning issues on the West Plains, including areas within WRIsAs 34 (Palouse), 54 (Lower Spokane) and 56 (Hangman / Latah) and also 43 (Crab Creek). Rob proposes to pull together a multi WRIA collaboration group to look at water resources issues in the West Plains – Cheney – Medical Lake – Four Lakes – Airway Heights area. The group would include WRIsAs 34 (Palouse), 54 (Lower Spokane) and 56 (Hangman / Latah) and also 43 (Crab Creek) if this group is interested. Rob said that he is hoping to have an informational meeting in January 2007 and will keep this group posted.

**“Meteorological Data, Trends and Cycles” by Dr. Bob Quinn**

Dr. Bob Quinn noted that his presentation would comprise:

1. Weather patterns in the NW, in particular El Nino – La Nina.
2. Water budget concepts.
3. Water budget deficit in our local area.

We are located within a water budget deficit area. Our climate has a winter wet and summer dry pattern. The precipitation that falls as rain or snow is essentially evaporated or transpired by plants and there is very little annual surplus of water. Potential evapotranspiration is high, especially in the summer. The highest demand on water resources also tends to occur in the summer. Water surpluses may occur for some periods of time following rain or snow events, particularly in the autumn, winter or spring.

The internet has provided very good weather predicting resources. We have had some powerful storms over the last couple of days that have brought significant rains to the lowlands and abundant mountain snow (between 2 – 4 feet). This is an El Nino year – so early rain and snow is important since El Nino years are often (5 out of 6 years) typified by warmer than normal winters in the Pacific Northwest. Also, 3 out of 5 years have winter drought patterns.

Our weather tends to come in from the west and very rarely from the east. The next storm is brewing south of the Gulf of Alaska and will be in our area by the end of the day Thursday November 15. Another two storms are expected between Saturday and Monday night. The ten day forecast is for much of the same. We have already received 2.5 inches of precipitation this November which is higher than normal. The average precipitation for November is 2.2 inches. This November we may have 150 – 200 % of normal precipitation.

In the Pacific NW we are within the fall – winter – spring mid latitude storm tracks which result in fall-winter-spring precipitation maxima. Our summers are hot and dry which is an unusual climate pattern. There are a number of factors which make one winter different from another, including the El Nino – La Nina. El Nino is the development of very warm water that occurs in the eastern equatorial pacific, off the coast of Ecuador and northern Peru. El Nino occurs about every 5 to 7 years and is not cyclical. El Nino brings warm, wet conditions to the equatorial eastern Pacific and can upset the weather patterns across the world.

For years that are not El Nino or La Nina years, north Pacific sea surface temperatures can provide an indication of weather. If north Pacific sea surface temperatures are either strongly cold or warm, there is likely to be an influence on our storm tracks.

Looking at the El Nino – La Nina patterns over time since the 1950s (the Multivariate El Nino Southern Oscillation Index or MEI), these patterns are not symmetric. There are strong and weak events and periods of time dominated by El Ninos and vice versa. A strong El Nino event occurred over the winter of 1982/1983 that resulted in +9 degrees C in January. Two or three weak El Ninos have occurred back to back in 2002 / 2003. Last year we had a weak La Nina that provided us with some precipitation.

The El Nino – La Nina patterns are found in Andean ice-cores and can be traced back as far as 1,000 years. Using historical climate data, we can chart these patterns back to the 1880s. The Pacific NW and Western Canada have a strong tendency to correlate to El Nino – La Nina.

**Q:** At what depths do you take the temperature of the oceans?

**A:** Initially temperatures were taken by throwing a bucket over the side of the ship. This was modified to intake temperatures. Infra-red satellite data is now most commonly used (since the 1990s) because it provides much better coverage. But this information tends to provide temperatures that are a little too high in the tropics and are affected by ice cover. Infra-red satellite data is assessed for patterns as opposed to the absolute temperatures.

**Q:** How does El Nino tend to cause more hurricanes in the Atlantic and yet causes drought in the Pacific NW?

**A:** By creating certain types of pressure patterns in the upper and lower atmospheres, hurricanes do spawn off the western coast of Mexico but these tend to be blown out into the Pacific. Occasionally, these storms will occur over Baja. This year, El Nino has tended to suppress hurricane development in the Atlantic and Caribbean and increase hurricane development in the eastern Pacific.

El Nino tends to cause high pressure off the western coast of the US and causes a split storm track, with one arm that heads north towards Canada and Alaska (causing warm, wet winters) and a second track that heads south into Southern California (also causing very wet winters). The Pacific Northwest, in the middle of these two tracks, tends to have warm, relatively dry winters. On average, in our area, El Nino tends to cause warmer, drier winters and La Nina tends to cause cooler, wetter winters.

Looking closer at Washington for the strongest cases, El Nino has a tendency to result in the following:

- Dec – Jan – Feb that are a little warmer but could also be cooler than normal.
- Dec – Jan – Feb that tend to be drier than normal but could also be wetter one in two years.
- Mar – Apr – May that may be a little warmer but could also be cooler than normal.
- Mar – Apr – May that tend to be drier than normal.
- Jun – Jul – Aug that tend to be warmer than average 2 out of 3 years.
- Jun – Jul – Aug that tend to be wetter than normal.
- Sep – Oct – Nov that tend to be cooler than normal.

Since the 1950s, there has not been a drought that resulted in crop failure. Crop failure occurs when the crop is not worth the money to harvest. The closest to crop failure we have seen in recent history is the 1976/77 year when we had dry winter, dry spring and a hot dry summer. Most El Nino's tend to result in wet springs that result in good soil moisture.

Looking at individual strong El Nino cases, the signals tend to be a bit mixed but generally warmer in the winter. This year is a weak El Nino that appears to have strengthened over the last month. The best fits to this year include:

- 1963-1964: warm mid winter with mixed precipitation including winter low elevation snow
- 1976-1977: cool winter and drought throughout the year
- 2002-2003: warmer than normal winter and mixed precipitation

**Q:** In 1963-1964, it did not seem as if there was a lot of precipitation but we ended up with 63 inches of snow?

**A:** It depends on the amount of snow per month. I would have to take a closer look at precipitation per month.

This year, the warm water is situated off the Alaska - British Columbia – Washington - Oregon coast. This suggests that it may not be a typical El Nino year. This will cause a number of storms in the fall and early winter as cold air flows over this warm water. This will result in more snow than normal in the mountains. However, this situation has a strong negative loop since the cold air will cool the warm water and is likely to last only a month or two (into mid December), depending on how big and deep the warm water pool is. After this time, the more typical drier El Nino pattern is likely to establish in the Pacific Northwest, as the storm tracks split.

**Q:** You noted that you do not know the depth of the warm water in the Gulf of Alaska.

**A:** This is one of the problems of infra-red – good coverage but no information on depths which means that we need to have other reports from oceanographic research ships to tell us about the depths. This information is likely to be out there some where on-line but is not easy to find. In the tropics, where the El Ninos form, there are permanent buoys that provide depth information.

**Q:** Is there any trend one way or another for global warming?

**A:** It is clear that as the climate warms the ocean temperatures also warm. The normals for average ocean temperatures have been revised recently because we were experiencing positive anomalies all the time. Ocean temperatures are on average 1 – 1.5 degrees C warmer than in 1930 – 1960. There have also been many new records set for temperature recently. There is no doubt that increased greenhouse gas levels cause warming and cause more warming than we would see without increased greenhouse gas emissions.

**Q:** In 1975 I took a class that linked pollution (such as sulfur dioxide) to the colder trends.

**A:** Yes, there is a theory that all the particulate in the atmosphere will reflect incoming radiation and would cause cooling trends. As we get particulate emissions under control, warming caused by increased greenhouse gas emissions will take over.

Dr Quinn presented a map showing precipitation across eastern Washington and northern Idaho. The dashed lines showed precipitation minus potential evapotranspiration. In our area, the results are negative:

- Harrington and Sprague: - 10 inches
- Davenport: - 8 inches
- Spokane: - 6 inches
- Spokane Valley: - 4 inches

In summer we tend to have strong moisture deficits. Therefore, a lot of water is needed to keep lawn and garden.

Dr Quinn made the following comments on the draft Phase 2, Level 1 Technical Assessment report:

1. The report is well done and cautions the reader not to use the water budget for detailed planning.
2. It is not possible to evapotranspire more water than falls on the ground (except over open water). But some of the data in the report has evapotranspiration greater than precipitation.
3. The geological resources do not offer much in terms of groundwater resources. Recharge to the basalt aquifers is very slow and larger wells will tend to result in mining of this resource. For residential wells, the basalt aquifers are probably fine.
4. The palaeochannels are old river beds filled with sand and gravels. These drain and if they contained large amounts of water there would be springs. However, there are no significant large springs. These palaeochannels may provide storage opportunities but it will require a lot of research to understand (for example, if water is put into a palaeochannel, will it drain out?)
5. The Spokane Valley Rathdrum Prairie aquifer system contains significant amounts of water but if we withdraw too much water from this aquifer, we may see the water table decline.
6. It appears that the summer low flows on the Spokane River have been declining, which are resulting in poorer water quality.
7. A more serious approach to conservation is needed (especially outdoor municipal water use and irrigation water) since huge amounts of water are used in the summer for irrigation.
8. Reservoirs along side the Spokane River may be appropriate to for storage of high winter / spring flows.

**Q:** The Columbia Water Management program is considering options to address groundwater levels declines in the Odessa area. What do you think of this?

**A:** To move surplus water there needs to be consideration of how much water is available for diversion and how much it will cost to convey. This approach might have some potential but it is a huge gamble because the water may move down through fractures in the basalt to areas that are not fractured. It took 1,000s of year to fill the basalt aquifers. The engineering to artificially recharge these aquifers is complex. It seems more appropriate to artificially recharge shallow aquifers that are easy to tap into and less expensive to monitor. Sands and gravels have 25% porosity. Basalt has 0.1% porosity. I feel that smaller surface reservoirs are an acceptable option along with shallow aquifers that are relatively close to the source of the available surplus water.

**Q:** Is there a portion of the decline in the Spokane River low flows that could be attributable to the weather? It does not seem like the decline is totally the result of water use.

**A:** Yes, there is a clear climate trend. The climate over the last two decades has resulted in snow tending to come into the mountains a little bit later and the spring runoff happening earlier in the year. The cause of this can be debated – but it is an observable trend.

Dr. Quinn noted that he has concerns about inchoate water rights. If a municipality has an inchoate water right, do they actually have real water? Dr. Quinn believes that many of these inchoate water rights may not be able to be exercised because the water is not available.

Bryony asked those with further questions to please write their question on a piece of paper. Bryony said she would collect any additional questions and email them to Dr. Quinn. The following questions were received by email and answered by Dr. Quinn:

**Q:** Given Columbia basin irrigation, is there a place where the increased transpired and evaporated water manifests itself in terms of raised humidity and reduced transpiration pressure, and/or in an increase in precipitation?

**A:** Good question!! There were a number of studies in the 60's and 70's that tried to answer the anecdotal observation of: did huge irrigation districts (Columbia Basin, Imperial Valley Calif) which added 20 to 40 inches of artificial precip (irrigated water) to a hot dry desert region change the precipitation climate. The answer was probably not. The air over the region is so hot and dry that the surface addition of moisture only occurs in the first 100's of feet and then mixes with the much drier air above and does not add enough moisture to influence rainfall. The lower level microclimate in terms of temp and humidity does change slightly. These figures are from memory but roughly:

1. In the immediate vicinity of an irrigation project. Max daily temps are lowered about 2 to 4 degrees. Night time temperatures may go up slightly due to better micro greenhouse effect.
2. The biggest effect is in relative humidity (RH) where in the immediate vicinity of an irrigation project RH values go up 5 to 10% during the day and 10 to 20% at night. But keep in mind not only is this a shallow effect but if normal RH's in a desert are in the 5 to 15% range we are increasing them to 10% to 35% at the most which is still dry.

**Q:** There is scientific data that suggests that dust contributes or creates drought i.e. desert expansions. Is the dust - drought issue going to be factored into watershed plans and has the current drought cycle been properly addressed? When taking on instream flow issues, one needs to consider dilution or lack thereof. With regards to water quality, how can drought (i.e., the lack of dilution or the concentration or take-up of pollution because of the lack of normal water into the system) be addressed any watershed plan?

**A:** I will try to answer the question in two parts. The dust-desert relationship has a lot of parts to it. The basic part is straightforward which often uses the term desertification. As man encroaches into desert regions and overgrazes the grasses, herbs and shrubs (Sahel in Africa) the anchoring and shading of the soil decreases and during the long normal dry season wind erosion increases. The wind blown sand and dust further desiccate the vegetation which expands the area of desert. A related issue in our region is dry land agriculture exposes wind erodible soil during the dry Sept period which as we all know can visit us as dust storms in Aug and Sept. Modern soil conservation practices requiring a certain amount of crop residue (stubble mulch) can at least reduce the amount of wind blown silt available to be transported.

The limerick sometimes goes "the solution to pollution is dilution" and while it is somewhat true, the answer is multifaceted. Reduce the amount of pollutants entering a system from sources but also look at dilution which for the Spokane system centers around the low flow Aug -Oct period. Periods of drought will create lower flows in the summer when only baseflow (ground water sources) are available to supply flow. While wetter years and wetter cycles may alleviate some of the high concentration problems it is clear that the decline in summer flow over the last 2 decades is only partially a result of climate impact. Under the current warming of climate the dry summer will likely last a little longer, the Spring runoff will come a little earlier, so low summer flows will be with us for the foreseeable future despite an occasional wet year. So we need to seriously look at measures to increase summer flow, which invariably require tradeoffs. Measures that have some potential include:

1. Hold water longer and higher in the Coeur d'Alene lake system which involves recreation use in the lake, power production at Post Falls Dam, and a very limited range of adjudicated lake levels.
2. Reduce summer demand on the aquifer and river. Irrigation is the largest component of this demand.
3. Carefully examine the input locations of pollutants that result in downstream oxygen depletion and look at remedial measures to reduce pollutants, provide better mixing for aerobic processes, and provide supplemental oxygen rich water in those locations. New locations for pollutant source industries (Second Sewage Treatment Plant) should be sighted not on the basis of politics, land economics, but on the basis of a cooperative ventures between municipal entities that maximize the lowering of BOD by state of the art facilities but also site the plant in a location that maximizes aeration for downstream flow. (Dreamer Quinn)

4. Ultimately if this area continues to grow, very serious conservation measures will become requirements with costs passed on to consumers, serious consideration of tributary storage (small reservoirs), and a careful examination of Spokane aquifer sources to see if any additional flow can be realized (Pend Oreille Lake inputs?).

And lots of other smaller measures !!

**Draft Technical Assessment Report Response to Comments by Cynthia Carlstad (TetraTech/KCM)**

Cynthia noted that the Tetrattech / KCM team is working on finalizing the WRIA 54 Phase 2, Level 1 Technical Assessment report. The comment period for the draft report closed on October 27, 2006. All comments have been compiled into one comment response matrix. This matrix will be included in the final report.

Cynthia noted that quite a few comments were received – including those from Hank Nelson, Ecology, Wes McCart, Brian Crossley, Lloyd Brewer, Bea Lackaff, Bill Gilmour, Reanette Boese, David Luders, Dick Price, Barb Rodgers and Bill Herrlinger. Cynthia noted that, although some numbers will be revised, none of the comments received will result in substantive changes to the report conclusions.

Judy noted that in the report the term Long Lake is used instead of Lake Spokane. Cynthia noted that a few comments were received on this. Cynthia plans to change this in the report to read, “Lake Spokane (Long Lake)”. Those present agreed.

Cynthia said that she would like to review the categories of comments with the group and, by the end of the agenda item today, reach a point where the group can give approval to the consultant team to finalize the report with an understanding that the team may work with individuals as needed to address specific comments.

**Q:** I realize that Dr. Quinn’s comments are too late, but he noticed that for some of the subbasins evapotranspiration (ET) exceeds precipitation. How do you plan to address this?

**A:** Dr. Quinn is explaining the theory that if the water is not there, it is not available to evapotranspire. Except, if the land is irrigated. I think that this is already covered in the water budget.

Lloyd noted that the use of irrigation water that is evapotranspired may cause ET values in excess of precipitation.

In the Water Rights and Water Use section, some of the numbers will be changing as a result of additional review by Spokane County and the consultant team. For example, Fairchild Airforce Base has water rights claims and certificates in Ecology’s database. However, the claims have gone through Ecology’s process to become certificates and should have been removed from the claims registry. So in the draft report these were counted twice. In the final report this error will be corrected.

Cynthia noted that she suggests that the following be added to the report conclusions and should be addressed in the Watershed Plan. There are a couple of border communities, including Fairchild and Medical Lake, with water sources inside WRIA 54 and most of the water use outside of WRIA 54. The water use spreadsheets have been changed by Spokane County staff to reflect this. A note will be added in the conclusions that the border communities should be addressed in the Watershed Plan and may require some special attention to ensure that they are plugged into the Watershed Planning process.

David Luders noted that Fairchild Airforce Base is mostly located in WRIA 56. The wellhead protection plan for Fairchild concludes that most of the water pumped comes from aquifers within WRIA 56. However, the WRIA 56 group chose not to include Fairchild Airforce Base’s information in their Watershed Planning process. David noted that it is important that Fairchild is included in this Watershed Planning process since they pump 4,000 gpm. Cynthia noted that the City of Spokane is in a similar situation in that it withdraws and uses water in more than one WRIA.

Lloyd noted that the City of Spokane is going through a Shorelines Master Plan Update and the recharge areas to the aquifers are one of the things that will be addressed. Currently, the Latah Creek drainage is not considered a groundwater recharge area. So, this needs to be addressed in this process also.

**Q:** At the last meeting we changed our Mission Statement to include sustainable water use. That is why we have a baseline to work from. If we don't have a baseline, how do we get to sustainable policy? We need to try as hard as we can to describe the baseline. I realize that this is hard to do.

**A:** In terms of the element that dominates the WRIA 54 water budget – the flow in the Spokane River – we have very good data. Our information on the tributaries is not as good. The climate data is also relatively good. The weakest link is perhaps our understanding of groundwater resources in the basalt aquifers – including recharge and groundwater flow directions.

Cynthia noted that the Airway subbasin includes the Airway Heights area as well as the portion of the Spokane Valley Rathdrum Prairie Aquifer in WRIA 54. In the final report a conclusion will be added to note this subbasin is very diverse and to recommend that different planning areas are designated for the Airway subbasin. The subbasin designations in the report are the Washington State Department of Natural Resource Watershed Administrative Units (WAUs).

Fish rearing was calculated as a consumptive use – this will be corrected. There was also some confusion about the terms “exempt well water use”, “urban irrigation” and “net demand”. These will be clarified in the text. For example, Dick Price has recommended using the terms “outdoor water use” and “in-house water use”.

A number of people raised water quality issues that were not covered in this document. This is a water quantity focused Phase 2, Level 1 Technical Assessment. The water quality component was scoped as a very broad overview of water quality conditions using the TMDL composite report. Cynthia noted that this list of water quality issues be used as a starting point for items that could be addressed in the water quality supplemental work. Those present agreed.

Rob Lindsay noted that the optional storage element application has been submitted to Ecology. Administratively, it is difficult for the County to take on the storage project as well as transitioning into Phase 3. The County plans to delay the water quality grant application for a couple of months. Spokane County anticipates that discussions on the water quality supplemental project will start in February / March 2007.

Cynthia noted that the draft report is missing information for the Spokane Reservation. Brian has promised to provide this. We will be adding land use and population information, water systems and some additional stream flow data. In addition, Wes McCart has provided more information about the Chamokane Creek adjudication and the upper and lower Chamokane aquifer systems.

In the report some possible future scenarios for build out (based on County zoning) are presented. A number of people commented on this. This information does not necessarily reflect growth projections. Zoning is tied to conditions such as soils. The consultant team feels that this is the responsible information to provide – but we do not want people to misunderstand this information. We will clarify this in the report text. Bill noted that the biggest perception problem was the apparent conversion of forest land to crop land.

**Q:** Maybe there is a better way to title the figure?

**A:** We are working on this.

**Q:** Have you communicated with Brian Crossely about his comments?

**A:** No, we have been unable to connect. We hope to talk / email in the next week or so.

**Q:** What is the relationship between the zoning information used and GMA boundaries? Things could have been approved in the zoning process that may now be restricted by GMA. Does this information present growth that is currently permitted by GMA? Showing these boundaries may give people a different perspective.

**A:** I need to check this because we do have the UGA boundaries. These boundaries are not shown on the zoning maps.

It will be noted in the text that public water can be provided to the areas where growth is expected but is not currently served by a public water system. The consultant team will clarify that the infrastructure to do this does not currently exist.

Those are the main comments and how we are proposing to address them. If everyone feels comfortable, we would like to go ahead and finalize the document, working with individuals to address their comments. In this way we can have the final report complete by the next Planning Unit meeting.

Rob Lindsay noted that Spokane County's agreement with Ecology includes Planning Unit approval of the response to comments. It is not specific as to how this is done. Rob proposed that the response to comments document, once finalized by Cynthia, be distributed to the Planning Unit with a specified response time. A lack of response will indicate that you are OK with the response to comments. Lloyd noted that he agrees with this conceptually but would not agree to finalize the document without seeing all the responses to the comments.

Cynthia said that she hoped to have the response to comment document completed by mid December 2006. Once completed, this document will be emailed and mailed out to the group. The group agreed to a two week review period, not including the Christmas week. After the review period, follow on communications will occur with individuals as needed. Unless an individual requests further discussion of the responses at the January 2007 meeting, the report will be finalized and will be ready at the January 24, 2007 meeting.

Bryony will send out the compilation of comments (without responses) via email following this meeting.

#### **Review Consolidated Issues (if time allows)**

Bryony asked everyone to pick up copies of the draft memoranda summarizing the issue identification and subbasin prioritization exercises. These memoranda will be reviewed early in 2007.

#### **Public Comment**

Jim complemented the group on the work that has been put in to complete the technical assessment document.

#### **General Schedule Announcements**

The following meetings are scheduled:

- The next WRIA 54 Steering Committee is scheduled for Wednesday December 13, 2006, 10 am – noon at the Spokane County Public Works Building, Conference Room 4A, 1026 W. Broadway Ave, Spokane, WA 99260. This meeting is open to everyone.

#### **Next Meeting Date and Adjourn**

The next Planning Unit meeting is scheduled for January 24, 2007, 6:00 – 8:00 pm at the Lakeside High School library. The library is located opposite the cafeteria.

The meeting was adjourned at 12:15 pm.