FINAL
Meeting Summary
WRIA 54 - Lower Spokane River Watershed
May 23, 2007

Location: Lakeside High School Library, Nine Mile Falls, WA.

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

Lloyd Brewer, City of Spokane
Sara Hunt, WA State Dept. of Ecology
Hank Nelson, Avista Corporation
Dick Price, Stevens County PUD#1
Craig Volosing, Landowner
Dave Moss, Spokane County Utilities
Brian Farmer, WA State Dept. of Ecology
Stan Miller, Citizen
Cynthia Carlstad, TetraTech
Jon Rudders, GeoEngineers
Rob Lindsay, Spokane County
Mike Hermanson, Spokane County
Steve Silkworth, Avista Corporation
Brian Crossley, Spokane Tribe
Albert Tripp, City of Airway Heights
Bob Derkey, WA State Dept. of Natural Resources
Bea Lackaff, Citizen
Charlie Peterson, Spokane County Conservation District
Dan Myers, GeoEngineers
Liz Korb, TetraTech
Bryony Stasney, Golder Associates Inc.
Wes McCart, Stevens County Farm Bureau and Stevens County Water Conservancy Board
Jeanne Barnes, Spokane Association of Realtors and Lake Spokane Park Homeowners Association

Call to Order

Bryony opened the meeting at 6:00 pm. Attendees introduced themselves and the interest / organization they represent. Bryony requested that each attendee complete the sign-in sheet.

Review and Approve April 25, 2007 Meeting Summary

The draft April 25, 2007 WRIA 54 Planning Unit meeting summary was reviewed page by page with the following edits: 1) Wes noted that the table on page 3 showing water uses has an asterisk associated with the quantity limit for stock watering (denoting that this item has not been tested in court, but is based upon Attorney General Office formal opinion). Wes said that the asterisk should be associated with all uses, quantity limits and acreage limits since none have been tested in court and are based upon Attorney General Office formal opinion. 2) Rob Lindsay clarified on page 5, 2nd sentence, last paragraph, that Spokane County will be helping to coordinate the WRIA 54 and WRIA 55/57 instream flow recommendation workgroup and will apply for a watershed council grant to support this work. The word "will" in the second sentence will be changed to "may" to reflect that no decisions have been made at this time on how the instream flow work group will be coordinated. Bryony said that she will ask the Planning Unit to confirm the final summary at the June Planning Unit meeting after clarifying the water uses table on page with Brian Walsh (Ecology).

Public Comment

Rob Lindsay noted that Ecology is accepting proposals from Watershed Planning groups for implementation projects. Rob noted that the WRIA 54 process is not sufficiently far along in the planning process to submit applications. Spokane County will be submitting an application for financial assistance for coordination / facilitation of the instream flow setting recommendation workgroup through WRIA 55/57 (since WRIA 55/57 has an adopted Plan). Also, WRIAs 34 and 56 will be submitting a grant application to perform orientation (i.e. pilot projects) for geophysical surveys on the West Plains. The results of the pilot projects will be used to support a geophysical survey work plan.

Presentation on "Spokane River Operations" by Steve Silkworth, Avista Corporation

Steve noted that is a presentation on how the Spokane River keeps the lights on and covers: 1) power generation resources and customer load; 2) Post Falls Dam and Coeur d'Alene Lake operations; and, 3) Spokane River operations.

Power for Avista Customers

- The Spokane River Project provides 9% (95 - 100 average Megawatts) of the electric generation required by Avista's customers. The Spokane River Project does not include Little Falls (which generates about 20 – 25 average Megawatts).
- This power is produced locally and used locally.
- The economic benefits from the project go to Avista's customers.

A take-away

Generation (including sales and purchases) must equal customer load virtually every second. The generators in the Spokane River plants do not respond to second-to-second load demands. Other generators in Avista's system do.

Locally, Avista has a peaky load with low loads at night and high loads in the morning / afternoon, depending upon the season. There is little industry in Spokane. Customers are primarily residential. Steve showed a graph of generation / load during July 24, 2006 when Avista asked customers via radio to conserve electricity. This was a Monday and the third 100+degree day in a row. Per industry practice, Monday loads are always estimated on the Friday before. Avista under estimated the load. During the day, Avista had problems with thermal generation (coal and gas plants) and there was a power shortage throughout the northwest. At 3 pm, loads peaked at about 1,630 megawatts. Normally the load would have peaked at about 5 pm, so the radio request to conserve electricity did help. With all plants running and with power purchases, Avista was just barely able to generate enough power to meet the load. The electricity price on July 24, 2006 reached $400 / megawatt-hr (the FERC cap). Avista customers pay about $60/megawatt-hr. The Spokane River operations saved Avista (and its customers) about $800,000 on July 24, 2006.

Q: What percent of Avista's customers are in the Spokane region?
A: We have about 350,000 customers in eastern WA and northern ID. About 200,000 of these are in the Spokane area. About 1/3 of our customers are in Idaho. Avista also provides gas in northern Oregon.

Spokane River Generation – Post Falls Dam and Coeur d'Alene Lake

The first dam at Post Falls was built in 1907 at 2,118 ft amsl. Avista's current dam, located at the same site (about 9 miles downstream of Coeur d'Alene), has an outlet elevation of 2,128 ft amsl. The Post Falls project makes about 9.5 average megawatts (about 6,500 homes). Coeur d'Alene Lake is formed by a natural outlet restriction created during glacial periods. When inflow > outlet capacity, the lake rises. When inflow < outlet capacity, the lake falls. Coeur d'Alene Lake provides natural flood control downstream.

Avista controls the Coeur d'Alene Lake level about 5 to 7 months of the year. During the rest of the year, the lake and river are on free flow conditions. At the end of spring runoff, Avista holds the summer level (2128), subject to minimum flow. About nine years out of ten, the lake fills to 2128 without any influence from the dam at Post Falls. This year, due to a lot of snowmelt in April, Avista started controlling the lake earlier than usual in mid May. Avista drafts the water in Coeur d'Alene Lake after Labor Day as low as possible until nature takes over. The entire Spokane River makes about 120 average megawatts. The average energy gained from storage is about 4 megawatts.

The next dam below Post Falls is the City of Spokane's Upriver Dam, located about 4 miles upstream of the City of Spokane.

Spokane River Generation – Upper Falls Facility

- "Run of river" facility with no operating storage. 50 ft natural falls.
- Generating Capacity = 10 MW. Constructed in 1922.

Spokane River Generation – Monroe Street Facility

- "Run of river" facility with no operating storage.
- Minimum flow over dam = 200 cfs during viewing hours.
- Generating Capacity = on average 12 MW, max 15 MW. Constructed in 1890. Rebuilt in 1992.

Spokane River Generation – Ninemile Facility

- Operated as run-of-river.
- Generating Capacity = 26 MW, 6500 cfs flow.
- Constructed in 1908 by Spokane and Eastern Railway. Purchased in 1925. Two units upgraded in 1992 – 1993.

Spokane River Generation – Long Lake Facility

- Some storage may be used to meet hourly, daily, and weekly energy demand.
- Generating Capacity = 72 MW. This is the highest generating facility on the Spokane River.
- Constructed in 1915.

Spokane River Generation – Little Falls Facility

- Operates in tandem with Long Lake.
- Generating Capacity = 36 MW. Constructed in 1910.
- Lake Roosevelt's operation affects Little Falls.
- Not licensed by FERC. Regulated by Washington State.

Avista Contact Information
Website - *www.avistautilities.com*
Relicensing - Bruce Howard (509) 495-2941
Water Information - Pat Maher (509) 495-4283, Steve Esch (509) 495-4196
Avista Water Information Recording - Idaho (208) 769-1357, Washington (509) 495-8043

Q: How would the Spokane River flow if there were no dams on the Spokane River?
A: Without Post Falls Dam, Coeur d'Alene Lake and the Spokane River upstream of the dam would be significantly lower in elevation (i.e., about 6 – 8 ft lower) and there would be more water in the Spokane River in July. However, flows in January, February, March, April and May, August and September in the Spokane River would be similar if Post Falls Dam was not in place. Without Post Falls Dam, flows in the river in October and November would be lower (since this is the time over which Avista drafts Coeur d'Alene Lake).

Q: From where does Avista purchase electricity?
A: From all over the Northwest. Over the last few years, purchases have been mainly from banks (who purchase from other generators).

Q: Does Avista promote education on conservation?
A: Yes. We are currently working on conservation efforts for summer 2007. July 2006 was 5 degrees higher than normal and a lot of electricity was used by our customers. Low cost air conditioners may be the cause.

Q: What would it take to construct a facility that would be able to generate power from high spring flows?
A: Electricity costs have to go up significantly or, construction costs have to go down significantly. Avista could divert from Upper Falls and run the water down to Monroe Street to gain 70+ft of head. Construction

costs to upgrade Monroe Street are very high. It is cheaper to purchase electricity or build another type of technology..

Q: Is Avista considering nuclear power?
A: We are considering nuclear power in 15 – 20 years. There is a new State law that will prohibit coal-fired power plants using non-sequestered coal. Moving forward, Avista's resources will be natural gas and any renewable power sources that we can find.

Q: Do you predict an increase in-home generation systems like solar panels?
A: The technology has advanced but is still very expensive. Puget Power has announced a plan to build a utility scale solar power generation plant near Vantage that will result in generation costs of about $350/megawatt-hr. Here, people pay about $60/megawatt-hr. On the scale of a home, power generation costs are about $500/megawatt-hr.

Q: What is the ratio of residential use to commercial / industrial use in our area?
A: Industrial use is less than 25%. Commercial use is about 36%. Residential use is about 41%.

The group thanked Steve for his presentation. A copy of the presentation will be posted on the County's web site at http://www.spokanecounty.org/wqmp/wria54.htm.

Draft WRIA 54 Multi-Purpose Water Storage Assessment by Tetra-Tech and GeoEngineers

Cynthia introduced the team at the meeting: Liz Korb from TetraTech and Jon Rudders and Dan Myers from GeoEngineers. Cynthia noted that copies of the draft report are available at the front of the room.

This assessment is completed in Phase 2 of Watershed Planning as a survey-level study to examine multi-purpose water storage options that could meet the future needs of domestic, agricultural, and commercial/industrial uses. The Planning group will make recommendations for water storage that will be included in the WRIA 54 Watershed Plan (Phase 3 of Watershed Planning), to be completed by 2009.

Assessment Scoping
The WRIA 54 Storage Work Group provided guidance on the scope of the project to include:

- WRIA-wide screening to identify feasible water storage needs and opportunities for WRIA 54.
- More focused studies in critical areas, including:
  - West Plains and Suncrest regions where Phase 2 Level 1 work concluded that major population growth will likely occur.
  - Chamokane Creek area due to the area's growth being stifled by lack of access to water rights.

Water Storage Elements
The three basic elements are: 1) capturing water when excess is available; 2) storing water by holding it or by allowing it to move over time over a designated flow path; and, 3) withdrawing or allowing water to discharge at a planned location. Projects outlined include structural and non-structural projects.

WRIA-wide Screening - Structural Alternatives

- Increased connectivity.
- Enhanced surface storage (including: instream reservoirs and impoundments; off-channel reservoirs; natural lakes; wetlands; beaver ponds; and balancing basins).
- Enhanced surface water recharge to groundwater (including: aquifer storage and recovery (ASR); direct injection to groundwater without recovery; farm field flooding; distributed small-scale catchment basins; enhanced infiltration for rural areas; enhanced infiltration for urban areas; reclaimed water use; and, direct pumping to surface water).

WRIA-wide Screening - Non-Structural Alternatives

- Water conservation
- Water rights transfers

West Plains and Suncrest Study Areas

Land use in Suncrest and the West Plains is still primarily rural and forested but is tending more towards urbanized land use, particularly across the West Plains. Water is provided primarily by pubic water systems.

West Plains – Problem Definition

- Targeted for growth with no feasible surface supply available.
- Infrastructure possible to bring water from Spokane, but expensive.
- Water level declines have been documented in the basalt aquifers but the limited dataset does not overwhelmingly support this. Additional groundwater monitoring is needed.

West Plains – Hydrogeology

- Three aquifer types on the West Plains: 1) bedrock; 2) basalt (Wanapum and Grande Ronde); and, 3) sand and gravel (palaeochannel and SVRP).
- Bedrock aquifers - water stored in fractures in bedrock and generally have low yield wells.
- Basalt aquifers - water stored in fractures and interflow zones, generally moderate to high yield wells with limited recharge area in WRIA 54.
- SVRP - small area adjacent to Spokane River.
- Palaeochannel - sand and gravel filled channels in basalts with generally high yield wells
- West Plains aquifers are layered: Wanapum basalt close to surface; Grande Ronde basalt underlies Wanapum basalt; bedrock aquifers underlie all of the West Plains.

West Plains – Predicted Future Water Use and Inchoate Water Rights

This assessment builds on information presented in the Phase 2, Level 1 Technical Assessment. Estimates are: current annual water use 5,830 acre-ft; future (year 2030) annual water use 9,350 acre-ft. Future (year 2030) population estimates at local scales were not available. Therefore, the assessment considers forecasts for Spokane County's transportation analysis zones (TAZ) and the number of future housing units (2.5 people per housing unit). Water rights and use analysis indicates that there are 11,654 acre-ft/year in inchoate water rights.

West Plains – Water Storage Opportunities – Structural Projects

Increased Connectivity

Water rights transfers or leases are easier than acquiring a new water right and allows water purveyors to move water from areas of excess to areas of need. Advantages include: 1) no additional storage; 2) use existing water rights; 3) use of most robust water source (i.e., SVRP) and may allow groundwater table in basalt to rise. Disadvantages include potentially high cost for infrastructure. Four potential alternatives are discussed in the draft report:

1. Alt 1- Fairchild AFB abandons Fort Wright infrastructure, sells the water rights for the Fort Wright wells to the City of Spokane, and purchases water from the City via the Mallen Road intertie - $6.8 Million.
2. Alt 2- Fairchild AFB sells the water rights for the Fort Wright wells to the City of Spokane and purchases water from the City via the Mallen intertie, while keeping the existing transmission line from Fort Wright available for emergency water supply- $19.2 Million.
3. Alt 3 - Medical Lake builds an intertie to connect to the City of Spokane. The intertie would also connect at Mallen Road or could be built in combination with the Mallen Road intertie to Fairchild AFB and split off where the Fairchild pipeline turns north. This intertie could be used for all water needs or just provide water in emergency situations- $3.1 Million.
4. Alt 4 - Fairchild AFB sells water rights and infrastructure to the City of Airway Heights and purchases water from the City through a short intertie connecting the Fort Wright pipeline to the Airway Heights water system - $11.1 Million.

Fairchild AFB water rights currently include water right claims so the validity of the claims would be assessed prior to sale / transfer of these water rights.

West Plains – Water Storage Opportunities – Structural Projects
Off-Channel Reservoirs
This would involve water diverted from the Spokane River to nearby reservoirs or storage tanks. Advantages include: 1) increased flexibility in reservoir location; and, 2) reservoir can be close to water needs. Disadvantages include; 1) high construction, operation, and maintenance costs; 2) location and permitting issues; and 3) high land use. Above ground storage tanks could be sited at a variety of locations throughout the West Plains. Costs for above ground storage are on the order of $1 per gallon of storage.

West Plains – Water Storage Opportunities – Structural Projects
Wetlands
Wetland storage using impoundments (such as dams) and restoration of previously drained wetlands. Advantages include: 1) improves water quality; 2) uses pre-existing sites; 3) wildlife habitat opportunities; 4) low cost; 5) Infiltration/aquifer recharge. Disadvantages include: 1) hard to control water release; 2) small increase in storage volumes. In the West Plains, existing wetland areas are limited in size.

West Plains – Water Storage Opportunities – Structural Projects
Wetland Reservoir Sub-irrigation System (WRSIS)
During winter and spring, excess water drains from fields to wetlands. Drained water transferred to wetland for temporary storage and sediment / nutrient removal. Water transferred from wetland to reservoir. During dry periods, water transferred from reservoir to sub-irrigate fields via perforated pipe. Benefits include: 1) water provided for irrigation from existing drainage and runoff; 2) creation of wetland habitat and improved irrigation water quality; 3) sub-irrigation does not have evaporation losses. Estimated cost (based on a demonstration project in northwest Ohio) - 1.0 million gallon wetland and a 7.5 million gallon reservoir irrigating 30 acres of soybeans and corn - $86,000 in capital costs.

West Plains – Water Storage Opportunities – Structural Projects
Enhanced Recharge to Groundwater
Increase infiltration of surface water, reclaimed water, or stormwater to raise groundwater levels. Methods include infiltration basins, small scale catchments, drywells, or perforated pipes. Advantages include: 1) can be large or small scale; 2) small scale projects are relatively inexpensive; 3) stormwater infiltration projects do not require new water rights; 4) infiltrates water within drainage area raising groundwater levels. Disadvantages include: 1) potential for groundwater contamination; 2) need for maintenance; 3) limited siting opportunities for large scale projects. Potential projects - infiltration of stormwater, reclaimed water, or stream water into basalt or palaeochannel aquifers.

Orange County Water District uses 2 large scale infiltration basins for Aquifer Storage and Recovery that offset 350,000 acre-feet of groundwater withdrawal.

On a smaller scale, a low impact development (LID) is an ecosystem approach that helps maintain natural hydrology by: preservation of native vegetation, reduction of impervious surfaces, hydraulic controls throughout a site and clustering of development.

In some cases (such as the West Plains) onsite management of stormwater is infeasible (e.g., space and/or low infiltration rates). For example, residential developments in area south of I-90 and west of Spokane have experienced significant property flooding. Spokane County is considering routing water via grass-lined ditches to higher permeable areas such as the palaeochannels.

West Plains – Water Storage Opportunities – Structural Projects
Aquifer Storage and Recovery (ASR)
Water is pumped into the aquifer at periods of high water availability and then is recovered during low water times. Advantages: 1) less evaporation than reservoirs; 2) less potential for contamination; 3) minimal damage to the environment; 4) small land area requirements. Disadvantages: 1) technically complex to implement; 2) relatively expensive to implement and operate; 3) specific aquifer requirements; 4) extensive site evaluations required. Potential target aquifers for ASR on the West Plains include basalt aquifers (Wanapum and/or Grande Ronde) and the palaeochannel aquifers. Potential sources of water for ASR include; 1) City of Spokane Drinking Water; 2) treated surface water (Deep Creek, Coulee Creek, Spokane River); 3) treated stormwater; and, 4) treated wastewater. Cost details are included in Table 4-4 of the draft report.

West Plains – Water Storage Opportunities – Structural Projects
Direct Injection to Groundwater
Water is injected into groundwater, similar to ASR, but instead of being pumped out, the water is allowed to migrate naturally to nearby water bodies. Advantages similar to ASR. Disadvantages: 1) hard to predict flow path of groundwater; 2) hard to predict discharge rates to surface water. Potential Projects include injection into palaeochannel or basalt aquifers to augment flows in Deep Creek or Coulee Creek.

West Plains – Water Storage Opportunities – Structural Projects
Water Reclamation
Reclaimed water is wastewater that has been adequately treated so that is no longer considered wastewater. Reclaimed water may be used for irrigation, groundwater recharge, surface water recharge, or wetland recharge. Main advantage is that this type of project frees up existing water supplies for potable uses. Disadvantages: 1) difficult to gain public acceptance; 2) additional costs and safety concerns (need for separate pipe system). Several local projects are being evaluated, including: Medical Lake (facility completed 2001), Airway Heights, City of Spokane and Fairchild AFB. Spokane County is starting a year-long reclaimed water project. The first public meeting is scheduled for May 30 at 7pm at the City of Spokane Valley Council Chambers. The City of Airway Heights is also considering a Class A reclaimed water project.

West Plains – Water Storage Opportunities – Non-Structural Projects
Water Conservation
Water conservation reduces the amount of water withdrawn from surface water and groundwater sources, leading to less impact on water supply sources. WRIA 54 Technical Assessment found that the use of water for irrigation far exceeds water used for other purposes. Potential conservation programs include:

- Public education on water use and waste
- Ensure that utility rate structures encourage water efficiency (most effective program)
- Equip homes with high-efficiency plumbing fixtures and appliances
- Increase irrigation efficiency with application nozzles, timers and distribution systems
- Leak management and repair
- Encourage low-impact development and xeriscape landscaping

Suncrest – Water Storage Opportunities
Cataract deposits are sands and gravels deposited in plunge pools created by glacial flood cataracts. Mapping by Washington Department of Natural Resources (contact Bob Derkey) includes cataract deposits in the Suncrest area. Water storage application could involve storing water during periods of high water availability in the cataract deposit and withdrawing stored water during periods of low water availability. Additional research will be needed to assess water storage opportunities related to cataract deposits.

Chamokane Creek – Water Storage Opportunities
Chamokane Creek is a relatively large watershed to the Spokane River in WRIA 54. The Spokane Tribe reservation borders Chamokane Creek to the west and extends to the eastern side of CC. A Fed adjudication granted water rights the Spokane Tribe for irrigation and instream flow which essentially consumes all available

water in the basin with the exception of a lower aquifer which is not likely to be included in the adjudication and is believed to exist in the upper portion of the watershed. The following lists potential water storage options for Chamokane Creek: water rights lease/purchase (primarily from the Spokane Tribe); side canyon reservoir (e.g. Sorenson); conservation/water reuse; headwater beaver habitat; and, deep aquifer exploration.

Conclusions and Recommendations - West Plains
Options that show the most promise are:

- Human water needs
  - Increased connectivity/water rights transfers
  - Conservation/water reuse
  - Aquifer storage and recovery
  - Wetland reservoir sub-irrigation system
- Aquifer preservation and restoration
  - Enhanced infiltration
  - Wetland restoration

Conclusions and Recommendations - Suncrest

- Monitor population growth and water supply planning
- WRIA-wide opportunities could play a role
- Cataract deposit – assess for possible future ASR opportunity

SCHEDULE FOR DRAFT WRIA 54 MULTI-PURPOSE STORAGE REPORT

- Draft report available on the County's web site
- Comment period ends July 31
- Comment response available by August 31
- Finalize Report by September 15

Send comments to cynthia.carlstad@tetratech.com or mhermanson@spokanecounty.org.

Q: Regarding groundwater declines on the West Plains, are the declines occurring in shallow or deep wells?
A: The graph in the presentation is Airway Height's Parkwest Well, a deep basalt well. Four Lakes, Medical Lake and Fairchild AFB also have deep wells in the basalt in this vicinity. Declines in groundwater levels have been documented in both shallow and deep basalt wells. Rebound in groundwater levels have also occurred in some wells with the recent wetter weather. In general it appears that groundwater levels declines are occurring in the Wanapum basalts. Some wells in the Grande Ronde basalts are also showing declining groundwater levels. Groundwater levels in the palaeochannels show no evidence of declining trends.

Q: How deep are these wells?
A: The Wanapum is the upper basalt and occurs within the upper 100 to 200 feet below ground surface. The Grande Ronde basalt formation occurs below the Wanapum basalt and ranges from a couple of hundred feet thick to up to 1,000 feet think in the vicinity of Cheney.

Q: What is the source of the water used by Orange County Water District for infiltration?
A: Water from rivers, stormwater and reclaimed wastewater.

Water Quality Update

Mike Hermanson noted that the water quality scope of work is available at the front of the room. The application will be submitted to Ecology next Thursday (May 31, 2007). Mike asked the group to submit comments to him by May 30, 2007. It is hoped that the project will start on July 1, 2007.

Instream Flow Update

Mike Hermanson noted that the County requests statements of support / objection on the report findings by Friday May 25, 2007. Once these have been received by the County, they will be documented and the final

report will be prepared. The instream flow recommendation work group for WRIAs 57 and 54 will kick-off on June 27, 2007.

Phase 3 Update

Mike Hermanson noted that Spokane County has received the Phase 3 grant from Ecology. The County is currently working on the scope with TetraTech and Golder.

General Schedule Announcements

The following meetings are scheduled:

- The next WRIA 54 Steering Committee meeting is scheduled for Wednesday June 13, 2007, 10 am – noon at the Spokane County Public Works Building, 1026 W. Broadway Ave, Spokane, WA 99260. This meeting is open to everyone. Conference room to be announced.
- Spokane County is hosting a public meeting for the water reclamation project on May 30 at 7pm at the City of Spokane Valley Council Chambers on Sprague.
- A joint WRIA 54 and WRIA 55/57 instream flow meeting is planned for Wednesday June 27, 2007, starting at 1 pm at the Airway Heights Community Center.

Next Meeting Date and Adjourn

The next WRIA 54 Planning Unit meeting is scheduled for Wednesday June 27, 2007, 10:00 am – noon at the Airway Heights Community Center. The meeting was adjourned at 8:10 pm.