FINAL
Meeting Summary
WRIA 54 - Lower Spokane River Watershed
June 28, 2006

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

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

Jim DeGraffenreid, Lincoln County Planning
Lloyd Brewer, City of Spokane
Keith Holliday, WA State Dept. of Ecology
Bea Lackaff, Citizen
Hank Nelson, Avista Corporation
Bart Haggin, Lands Council
Brian Crossley, Spokane Tribe
Jerry Warner, Palisades Neighborhood
Judy Kaufman, Spokane Fly Fishers
Cynthia Carlstad, Tetra Tech/KCM
Reanette Boese, Spokane County
Bill Gilmour, Spokane County
Clay White, Stevens County Planning
Charlie Peterson, Spokane County Conservation District
Doris Dietrich, Landowner
Jay Landreth, Landowner
Craig Volosing, Landowner and Palisades Neighborhood
Nicole Powell, Lands Council
Vincent Jansen, Lands Council
Jonathon Rudders, GeoEngineers
David Luders, Fairchild Airforce Base and Indian Village Estates Water Assoc.
Jeanne Barnes, Spokane Association of Realtors and Lake Spokane Park Homeowners Association
Bryony Stasney, Golder Associates Inc.

Call to Order

Bryony opened the meeting at approximately 6:00 pm. Attendees introduced themselves and the interest / organization they represent. Bryony asked all to document their attendance on the sign-in sheet.

The draft May 24, 2006 WRIA 54 meeting summary was reviewed page by page with the following requests for changes: 1) Bryony noted that the page numbering in the footer on the first page was incorrect. Bryony asked the group for approval of the May 24, 2006 WRIA 54 meeting summary. With correction to the page numbering in the footer, those present accepted the May 24, 2006 meeting summary as final. The final summary will be posted on the County's web site at http://www.spokanecounty.org/wqmp/wria54.htm.

Public Comment

Bea passed around an article from the June 24, 2006 Spokesman Review for consideration by the group. The article reports that three chemicals (perchlorate, N-nitrosodimethylamine (NDMA) and trichloroethylene (TCE)) have been detected in wells in the Deep Creek area (north of Hwy 2 and Fairchild Airforce Base). The area is located between two former Defense Department missile sites west of Deep Creek, between Jacobs Road to the north and Sprague to the south. Calvin Terada of the Environmental Protection Agency is noted as the project manager for the ongoing investigation. Bill noted that there have been other similar articles recently and that the Army Corp of Engineers is becoming involved in the investigation since the area is associated with an old NIKE missile site.

Bart asked how fire retardant can get into the river in quantities large enough to be measured. Reanette noted that this is a different situation to that of the Deep Creek area. Lloyd Brewer said the fire retardant chemical is put into plastics to make them less flammable and, as the plastics age and break down, the fire retardant chemical is released. Sources may include appliances in the home and plastics outside that may leach the chemical into stormwater.

Bryony provided each of those present with a blank piece of paper and a pencil and asked everyone to draw their watershed and anything important to them. The purpose of the exercise is for the technical team to better understand the issues that are currently important to the Planning Unit members.

Phase II Data Compilation Presentation by Cynthia Carlstad (TetraTech/KCM) and Jonathon Rudders (GeoEngineers)

Cynthia noted that this is the Step 3 presentation of the technical assessment information and will be a preview of the water budget information that will be included in the draft technical assessment report. The draft technical assessment report will be released to the Planning Unit at the July 26, 2006 Planning Unit Meeting. The presentation is available at the County's web site at http://www.spokanecounty.org/wqmp/wria54.htm. The following summarizes the presentation and discussion.

Technical Assessment Schedule

- April – Presented base mapping – land use, geology, hydrology, hydrogeology
- May – Discussion about water balance expectations, pros and cons, proposed focus areas
- **June (tonight) – Water balance methods and preview of results**
- July – Draft Technical Assessment will be available at the July 26 Planning Unit meeting
- August – Presentation and discussion of Technical Assessment
- September – More discussion about Technical Assessment findings
- October – Finalize Technical Assessment.

It will be important that everyone is able to become familiar with the information, understand where the data gaps are and the limitations of the information. Cynthia noted that the report will likely be general and less than 100 pages long. The detailed information (e.g., data and tables) will be included as appendices.

Q: Bill asked Brian if the Spokane Tribe was going to present to the group in August.
A: Brian said yes.
Bill noted that there will be a presentation on meteorological data by a professor from Eastern Washington University in September. In order to maximize the time to discuss the draft Technical Assessment report, these presentations will be relatively short.

Q: Keith asked if there will a formal comment period and response to comments.
A: Cynthia said yes and that the final report is planned for October 2006. After the report is final, it will be important to have a mechanism to incorporate new assessment information during Phase III of Watershed Planning. Bill suggested that comment period dates be developed at the next meeting and a public meeting be scheduled.

Cynthia passed the presentation over to Jon Rudders (a hydrogeologist with GeoEngineers) to present the water balance information. Jon noted that Dan Myers (a geologist with GeoEngineers) has completed most of the water balance work but could not be here tonight and that he would do his best to present the information.

Why Complete a Water Balance – The water balance is a required component of the Watershed Planning technical assessment and is an opportunity to characterize the various water components of the basin (e.g., groundwater, surface water, precipitation, consumptive water as net demand). The water balance at a watershed scale is helpful to identify gaps in understanding.

Water Balance Limitations – Many of the hydrologic components are not quantified on a subwatershed scale. Some of the components (e.g., groundwater) are poorly understood on a watershed scale. The precision of the water balance is limited by the least understood component. At this scale, a water balance often has limited use as a water allocation tool. It is useful to guide future investigations.

Subwatersheds– These are defined by topography and drainage. Jon presented an overhead listing the subwatersheds along with a map showing the delineations of the subwatersheds.

Q: Bill asked if there is a handout showing and listing the subwatersheds.
A: Jon said no and that he would provide this to Bill to send out to the group.

WRIA 54 Water Balance Components– These include the inflows that enter the watershed and the outflows that leave the watershed. Inflows are: surface water (SWI), groundwater (GWI), precipitation (P) and imported water (IW). Outflows are: surface water (SWO), groundwater (GWO), evapotranspiration (ET) and net demand (ND). The difference between inflows and outflows is the change in the volume of water stored in the basin. With limited data to support a water balance, assumptions and estimates are needed and there can be large error associated with some components. The general water balance equation used in this technical assessment is:

Change in storage = Inflows – Outflows = (SWI+GWI+P+IW) – (SWO+GWO+ET+ND)

Jon cautioned the group not to take the preliminary numbers provided in this presentation as set in stone and rather to use the numbers to reflect the relative magnitudes of the various inflows and outflows.

Bill noted that the imported water component is important in WRIA 54. For example, all of Spokane's wastewater is discharged into the Spokane River in WRIA 54. Jon said that GeoEngineers has estimated this inflow at about 1% of the annual flow of the Spokane River.

Water Balance Inputs– Inputs = surface water inflow + groundwater inflow + precipitation + imported water.

Surface Water Inflow – Streamflow measurements are the primary method for obtaining data for the surface water inflow component. Streamflow is typically reported on a daily basis by, for example the USGS and Spokane Community College. For this work, we have computed monthly averages from the daily data to give us information for the monthly and annual water balances. The gages used to estimate inflows include:

- Spokane River –gage at Spokane
- Little Spokane River – gage at Dartford
- Latah Creek – gage near the Latah Creek – Spokane River confluence

Reanette Boese noted that there are two gages on the lower portion of the Little Spokane River and it will be important to use the downstream gage or account for groundwater inflow since the Spokane Valley Rathdrum Prairie Aquifer discharges a significant amount of water into the lower reaches of the Little Spokane River.

USGS gage stations are typically set up to take a gage height measurement every 15 minutes and convert the gage height to a flow using a rating curve. Daily discharge is computed from these 15 minute measurements. The USGS will take flow measurements to make sure the rating curve is accurate typically about once a month.

Jon presented a hydrograph (graph of flow in cubic feet per second (cfs) versus time) of the information collected at the Spokane River at Spokane gage showing maximum, average and minimum flows for the period of record for the gage. The maximum flows are close to 45,000 cfs and the minimum flows are below 1,000 cfs. The high flows typically occur in the winter and spring and the low flows in August and September.

For the water balance, the streamflow data is used to develop a hydrograph of the average monthly flow volume (acre-feet). For the Spokane River at Spokane gage, the highest flow volumes occur in May (about 1,100,000 acre-feet) and the lowest in September (about 100,000 acre-feet). On an average annual basis, about 4,800,000 acre-feet of water flows through the Spokane River at the Spokane gage.

Groundwater Inflow – The groundwater inflow values are estimated based on understanding of the aquifers in and around the watershed. Groundwater will flow into and out of the watershed via aquifers and in most cases,

the aquifer boundaries may not match up with the WRIA boundaries (which are hydrologic or surface water boundaries). There are few wells within the watershed to determine groundwater flow directions, especially for the basalt aquifers and the Chamokane Valley Aquifer. The USGS bi-state aquifer study is currently ongoing and includes primarily the Spokane Valley Rathdrum Prairie Aquifer. The Spokane Valley Rathdrum Prairie (SVRP) Aquifer occurs at the southeastern edge of WRIA 54 and terminates in WRIA 54. It is hoped that the ongoing study will provide information on where and how much water enters the Spokane River from the Spokane Valley Rathdrum Prairie Aquifer and if there is significant recharge to adjacent basalt aquifers in WRIA 54.

The SVRP aquifer is a very transmissive aquifer and has a high potential to yield water to wells. However, entities in WRIA 54 may not be in a suitable location to convey water from the SVRP aquifer or are reluctant to use existing interties. Instead, most entities rely on other less transmissive aquifers in WRIA 54 for water supply, such as the basalt aquifers. In some areas, the basalt wells can have relatively high yields. For example, the basalt wells in Airways Heights can yield up to 1,000 gpm. Airway Heights and Fairchild Airforce Base also have interties from the City of Spokane.

David Luders noted that Fairchild Airforce Base obtains most of its water supply from the Latah Creek aquifer and that this aquifer should be included in the WRIA 54 technical assessment. The groundwater table in the vicinity of their wells is 32 feet higher than that of the Spokane River and the wells are not under the influence of surface water. Fairchild Airforce Base staff checks the water level elevations in the wells daily. Buchanan and Associates completed the wellhead protection plan for Fairchild Airforce Base. This report includes general information on the Latah Creek aquifer. Jon said that he would be interested in obtaining this information if they do not already have it.

David Luders noted that wastewater produced at Fairchild Airforce Base (about 80% of the potable water used on the base) is conveyed to the City of Spokane's wastewater treatment plant which is located about one mile downstream of the wells. Fairchild Airforce Base does not use the intertie with the City of Spokane very much because the water is expensive. The base did use the intertie a couple of years ago when they completed maintenance on a storage tank. Fairchild Airforce Base also has another well located just outside WRIA 54 in basalt that produces about 750 gpm but does not like to use this well due to interference with Medical Lake and Airway Heights wells.

Q: Jerry asked David if the 16-inch steel pipeline conveying water to the base leaks anymore.
A: David said that over the last couple of years Fairchild Airforce Base has surveyed the pipeline and has checked and repaired sections of the pipe.
Craig said that sections of the old wooden pipe still exist and that he has noted water flowing in sections of the old and now unused pipe.

To estimate groundwater inflow, Jon said that they will characterize the location and natures of the aquifers in WRIA 54, develop cross sections and estimate groundwater inflows using an equation based on Darcy's Law. Jon noted the basalt aquifers and the SVRP aquifer as being the most important in terms of groundwater inflow into the watershed. Flows from the basement rocks (e.g., granites, metasediments and gneiss that occur mostly on the north side of the Spokane River) are assumed to be negligible since the transmissivity and hydraulic conductivity of the basement rocks are typically very low.

Precipitation – Jon presented precipitation data for the watershed from the Oregon Climate Service Parameter-elevation Regressions on Independent Slopes Model (PRISM). An estimate of precipitation is provided in 4km blocks for the watershed. This information indicates that the highest annual precipitation is around 22 to 24 inches in the northern part of the watershed and the lowest is between 11 to 15 inches in the southern part of the watershed. Precipitation is a function of elevation, with higher annual precipitation occurring on higher ground in the watershed. This information indicates that the total annual precipitation is about 340,000 acre-feet.

Imported Water – This is water that is brought into the watershed via pipes. Sources of imported water include the City of Spokane's wastewater treatment plant and City of Spokane interties. The City of Spokane's wastewater treatment plant influent flows (1984 to 2005) were used to estimate wastewater inflow to WRIA 54 at about 40,600 acre-feet per year. Fairchild Airforce Base has data on sanitary sewer flows to the City going back to 1993 that can be provided to Jon for this project.

Q: Bill asked what percentage of Spokane River flow is wastewater at low flow times of the year.
A: Jon said that this percentage would be higher than 1% but that he did not know the percentage off the top of his head and could address this in the draft technical assessment report.

Based on the data received and with help from Spokane County staff, imported water is estimated at a total volume of 1,250 acre-feet per year (Fairchild AFB – 550 acre-feet per year + Airway Heights – 700 acre-feet per year). David noted that Fairchild AFB has an agreement with the City of Spokane to be able to use 2,500 gpm at any time using the intertie. The most water conveyed using the intertie was in 2004 when maintenance was completed on Geiger Reservoir. David noted that Fairchild AFB does not use 550 acre-feet per year on a normal basis. Fairchild AFB uses about 900 million gallons of water annually, most of which is pumped from the Latah Creek aquifer wells.

Water Balance Outputs – Outputs = surface water outflow + groundwater outflow + evapotranspiration + net demand.

Surface Water Outflow –The Spokane River gage at Little Falls Dam is the furthest downstream gage with a significant period of record. This gage is located in the central part of the watershed. The surface water – groundwater interactions along with tributary flows downstream of Little Falls Dam to the confluence of the Spokane River with Lake Roosevelt (e.g., , Mill, Spring and Blue Creeks) will also need to be added to the flow at Little Falls Dam to provide a reasonable estimate of surface water outflow from the watershed.

Jon presented a hydrograph of the flows at Spokane River Little Falls Dam showing maximum, average and minimum flows for the period of record for the gage. The maximum flows are over 45,000 cfs and the minimum flows are about 1,000 cfs. The high flows typically occur in the winter and spring and the low flows in August and September.

For the Spokane River at Little Falls Dam, the highest flow volumes occur in April (just less than 1,000,000 acre-feet) and the lowest in August (about 100,000 acre-feet). On an average annual basis, about 5,300,000 acre-feet of water flow through the Spokane River at Little Falls Dam. This annual volume is higher than the 4,800,000 acre-feet annually estimated at the upstream Spokane River at Spokane gage. This is expected due to the tributary inflows and significant amount of groundwater inflow, for example from the SVRP Aquifer.

Groundwater Outflow – For this component, GeoEngineers has identified areas where there appears to be significant subsurface outflow from the watershed. Taking a cross section across the Spokane River at the western edge of the watershed as an example and using well log information and professional judgment, GeoEngineers has estimated the groundwater outflow volume at the mouth of the Spokane River to be about 7,500 acre-feet annually (i.e. a small volume compared to the 5,300,000 acre-feet of water leaving the watershed as surface water flow).

Evapotranspiration – This is water that is lost to the atmosphere through evaporation and transpiration and can be a significant quantity. For this project GeoEngineers is using a Penman-Monteith energy balance model that incorporates site specific information for the watershed (e.g., maximum and minimum temperatures, latitude and longitude) and estimates evapotranspiration (ET) for a reference crop (in this case grass). Coefficients are then used for various other plant types (e.g., forest and rangeland) to estimate ET for these plant types. Agricultural census data is used to estimate the areas of various crops (e.g., wheat and potatoes) in the watershed. ET is associated with plant types and is not dependant on the source of water.

Jon presented a land use map for the watershed. The northern portion of the watershed is primarily forested and the southern part of the watershed is primarily rangeland and agricultural land. Estimated areas for these various land use types are developed using a Geographic Information System (GIS).

The ET model used does not take into account evaporation from surface water nor evaporation losses related to irrigation type. For example, there can be up to 30% water loss with spray irrigation. The ET calculation is not yet complete. Using GIS GeoEngineers has estimated that there are about 43,500 acres of surface water in the watershed. Using the pan evaporation at the Spokane Airport (48.41 inches annually) and applying appropriate correction factors for field conditions, GeoEngineers has estimated that about 41,000 acre-feet per year of water evaporates from surface water bodies in WRIA 54.

Q: How do you account for urbanization?
A: The land use mapping shows urban areas and we can apply an ET estimate to these areas in the same way that we apply an ET estimate to a land use such as forest or rangeland.

Net Demand– This is the difference between the amount of water that is removed from the watershed for domestic, municipal, commercial, industrial and agricultural purposes and the amount of water that is returned to the system. As an example, a homeowner with a well will pump a certain amount of water out of the ground for residential use. A certain amount of this water is used (e.g. for lawn and garden irrigation or drinking) and a certain amount is retuned to the ground via the septic tank.

There are four main net demand components that GeoEngineers think are important:

- Public Water Systems (Group A and B)
- Domestic Exempt Use
- Agricultural
- Industrial and Commercial

Jon noted that this is a work in progress and would appreciate any additional information. Jon opened the floor for questions.

Q: What do you classify as agriculture? Golf courses for example use a tremendous amount of water.
A: Golf courses would be classified as commercial and, if monthly water use is not available, the water right would be used to estimate water use.

Bill noted that Jon did a terrific job of presenting this information.

Cynthia said that they would be finalizing the draft technical assessment in the next couple of weeks and would appreciate any additional information as soon as possible now that the group have a better understanding of the type of information that will be included.

Multi-Purpose Storage Work Group Roster – First Meeting Date

Bryony noted that the individuals that have volunteered to be on the multi-purpose storage workgroup are listed on the handout provided for this meeting. Bill noted that the workgroup will have two main tasks:

1. To evaluate whether or not to put out a Request for Qualifications (RFQ) for the work from other consultants or to sole-source the work to the current consultant (i.e., the Tetra Tech / KCM, EESC, GeoEngineers and Triangle Associates team).
2. Once the consultant is hired, the workgroup will develop the scope of work for the multi-purpose storage assessment.

Q: Do you have any ideas yet of what types of storage strategies might be considered?
A: Bill said that there are several ideas but that it would be premature to discuss them now and that the ideas would be developed by the multi-purpose storage workgroup. In WRIA 55/57 about half of the grant funds were used to complete a general overview of storage opportunities and the remainder of the funds were used to focus on a couple of promising options in more detail.

The first meeting of the WRIA 54 multi-purpose storage workgroup was scheduled for July 12, 2006 starting at 1:00 pm at the Spokane County Public Works Building, Conference Room 4A, 1026 W. Broadway Ave, Spokane, WA 99260. Bill said that he would email out a reminder for the meeting.

WRIA 54 Mission Statement

Bryony made sure those present had two handouts:

1. A one page handout describing what a mission statement is, how to develop a mission statement and providing examples of mission statements from adjacent watersheds.
2. A four page hand out describing development of the September 2004 draft WRIA 54 mission statement.

Bryony asked the group to take these documents home and think about the September 2004 draft WRIA 54 mission statement and any edits that would improve on the draft.

Public Comment

Bill passed out a survey from Dunau Associates on Watershed Planning Unit participation that is being completed on behalf of the Washington State Department of Ecology. Dunau Associates would like the survey returned by July 21, 2006.

Bill also noted that EESC, the instream flow contractor, has been out on the Spokane River and they completed the WRIA 57 and 54 transects at a flow of 7,500 cfs. The contractor used a Doppler radar to complete the transect work which was very efficient. The flows have been dropping fast so they are expecting to be back on the river the week of July 5. Reanette noted that Avista were able to maintain the flows along the river at 7,500 cfs for the day of the work. Cynthia said that the field work went very well and thanked Avista for their help. Bea said that she can put some pictures on the web site that document some components of the field work. Cynthia said that a field trip for Planning Unit members will be scheduled for the last week in August / first week in September to coincide with the lowest flow measurement and the substrate characterization. The date for this field trip could be set at the July meeting.

Keith asked if the tributary work has been scheduled. Cynthia said that this has not been scheduled. Keith said that he would like this to be scheduled as soon as possible because Ecology's flow team is scheduled 6 weeks out. Cynthia said that she would get this scheduled.

Jerry requested that WRIA 54 be included in the subject line for all emails sent out to the email list. The group agreed.

General Schedule Announcements

The following meetings were scheduled and are open to the group:

- Steering Committee meeting - July 12, 2006 from 10:00 am to 12:00 noon at the Spokane County Public Works Building, Conference Room 4A, 1026 W. Broadway Ave, Spokane, WA 99260.
- Multi-Purpose Storage Work Group - July 12, 2006 starting at 1:00 pm at the Spokane County Public Works Building, Conference Room 4A, 1026 W. Broadway Ave, Spokane, WA 99260.

Next Meeting Date and Adjourn

The next Planning Unit meeting was scheduled for July 26, 2006 from 10:00 am to 12:00 noon at the Airway Heights Community Center. The meeting was adjourned at 8:02 pm.