7.0 RECOMMENDATIONS

7.1 INTRODUCTION

This Level 1 Technical Assessment represents a compilation and review of readily available data for WRIA 53 for the preliminary evaluation of the Water Quantity element of watershed planning. The watershed is in the lower portions of Lake Roosevelt, the reservoir that is formed behind Grand Coulee Dam. Water resources in the main stem of the Columbia River is under Federal control, and the State of Washington administers the instream flows in the river per WAC 173-563, a copy of which is provided in Appendix G. This assessment focused on review of readily information in order to determine if sufficient data was available to develop a water balance. During the review and evaluation, a widespread lack of hydrologic and hydrogeologic data was identified for the watershed. Depending on Planning Unit objectives, a number of these data gaps could be addressed during the Level 2 portion of Phase 2 and/or beyond in the watershed planning process.

7.2 ADEQUACY OF EXISTING DATA

This section includes a discussion on the adequacy of the existing data for WRIA 53, organized by data type. Primary data gaps are identified and general recommendations are provided for filling the respective data gaps.

7.2.1 Climate Data

Climate data was collected for four recording stations within and nearby the watershed, designated by the WRCC as Coulee Dam 1SW, Wilbur, Davenport, and Wellpinit. Station data was augmented by a basin-wide precipitation and temperature distributions developed using PRISM. These stations are located at or outside the boundaries of the WRIA 53 watershed. Existing data could be strengthened by the addition of additional climate stations to achieve a more complete distribution of data in the watershed. Specifically, additional climatic data within the Hawk Creek drainage may be beneficial to the planning effort.

Limited evapotranspiration data specific to WRIA 53 was encountered during this review. To estimate evapotranspiration, generalized assumptions for ET rates in semi-arid regions was used. A more detailed evaluation to determine ET rates may be beneficial for future water planning activities.

7.2.2 Planning Data

The watershed north of the Columbia River is located within the Colville Indian Reservation and falls under the Tribal planning codes. That area south of the Columbia River is primarily privately owned. These lands fall under the jurisdiction of the Lincoln County Planning Department. The County is currently evaluating planning and development codes, relative to integrating available water resources. Planning data is (GIS information) is well developed in the county. The County needs to further evaluate which criteria should be developed relative to land use and management decisions within the County. The collection of additional information specific to these areas would facilitate assessing development scenarios during preparation of the WRIA 53 Watershed Plan.

7.2.3 Surface Water Data

No surface water data is available within the tributary drainages of WRIA 53. Stream gauge installation and data collection along key tributaries within the WRIA would increase the understanding of watershed surface water hydrology.

7.2.4 Groundwater Data

Existing data regarding the hydrogeology of principal aquifers within WRIA 60 is limited. Identification, delineation, and characterization of principal aquifers (fractured bedrock, basalt, and unconsolidated) would be required to adequately estimate the groundwater resources available within the WRIA and each subbasin. The GWMA is currently evaluating the basalt aquifers in northern Lincoln and is expected to develop a groundwater model in the upcoming years. This study will assist in the management opportunities for the basalt aquifers. A more detailed review of the granitic basement aquifers could be completed by a more detailed review of well logs. Determining water resources in the unconsolidated aquifers could be completed by initiating a Critical Aquifer Recharge Area assessment.

7.2.5 Water Right Data

The water right analysis indicates that a more detailed review of the hardcopy files of the surface water rights in the basin may be warranted, especially within the Hawk Creek drainage. A more detailed analysis would provide a better level of understanding about the validity of these documents and the level of error in the estimated total annual quantity for surface water in the Hawk Creek subbasin. In addition, a more detailed review of water rights along the Columbia River should be conducted in order to identify which rights are conditioned upon Columbia River flows. An open water right adjudication on Hawk Creek from 1932 is also present in the watershed. Petitioning to close this matter would be beneficial to the Planning Unit.

7.3 Strategies for Increasing Water Supplies

Water diversions occur from streams and groundwater in WRIA 53 based on water right seniority. However, due to seasonal and annual variability in stream flow rates, and groundwater tables, water availability for further appropriation is not certain. Of specific concern, is the recent interpretation that the basalt aquifers are not being recharged from the Columbia River, and there is essentially a granitic basement “barrier” between the Columbia River Basalt Group aquifers and the major surface water bodies in the northern portion of Lincoln County. Currently, new water rights are not being issued in WRIA 53 and new groundwater appropriations are occurring from the transfer of water rights from upstream sources.

Several strategies may be warranted to assure future water supplies are sustainable in WRIA 53 as specified in RCW 90.82.070(2).

7.3.1 Water Storage Strategies

Retaining and/or slowing the transport of water within the watershed is a strategy that is being undertaken throughout eastern Washington. Within WRIA 53, large scale storage in Hawk Creek has been evaluated by Ecology, and has ranked within the top two feasible locations. In addition to large scale storage facilities, small and medium size storage opportunities may help to store and/or infiltrate surface water to assist with “flattening” the hydrograph. Smaller scale water storage strategies can include:

- Small Scale Offstream Storage – most feasible in the Hawk Creek drainage.
- Instream Storage – this could include constructing dams on the main tributaries, within the wetted perimeter. However, feasible alternatives are limited in the watershed.
- Onsite Catchment Systems – most feasible on private properties to assist with retaining spring runoff and infiltrating this water into the aquifers.
- Groundwater Recharge and Storage – this strategy would be integrated with the Columbia River Water Management Program to assess potential opportunities to divert available surface waters from the Columbia River and recharge the basalt interflows to the south.

7.3.2 Groundwater Supply Strategies

Upon completion of the GWMA hydrogeologic model, the WRIA may wish to implement a groundwater management and supply strategy which would include the proper management of the aquifers to prevent over-pumping. In the watershed, groundwater is primarily pumps from the Wanapum aquifer. Several strategies may be implemented to potential protect and/or protect the basalt aquifers.

- Support activities to permit replacement and/or future groundwater wells that are in high density areas to deeper basalt interflows which are documented to be recharged from recent water, as determined from the age dating results throughout the watershed.
- Support activities to case new wells and replacement wells across the Wanapum aquifer to avoid cross contamination and the potential of "dewatering" upper aquifers.
- Support activities to abandon inactive wells. Inactive wells that are not constructed properly or that have lost the integrity of their seal may allow aquifer cross-contamination.

7.3.3 Conservation

Water conservation strategies need to be included in the WRIA 53 Watershed Plan. However, agricultural water conservation is likely already practiced and occurring by irrigators in WRIA 53 due to the event of increasing irrigation costs. The degree of conservation effort by the public and private Group A water system is not known. However, due to the generally low volumes of water use across the watershed associated with low population densities, the total water volume is expected to be limited. Other methodologies for conservation efforts in the private sector should be undertaken in the watershed.

7.4 SPECIFIC RECOMMENDATIONS

In order to meet the water strategies outlined above, the following specific recommendations should be undertaken by the WRIA 53 Planning Unit during Phase 2-Level 2 and Phase 3 Watershed Planning.

With respect to the surface water system the following is recommended:

1. Establish flow gauging stations at selected streams and springs to better characterize water flowing into and out of the hydrologic system. Focus on the Hawk Creek drainage.
2. Use flow measurements to establish a baseline for comparing to future conditions.

3. Conduct period water quality measurements to better understand stream and spring health, especially as rural home density increases. Monitoring should be conducted at the locations where Ecology is conducting stream flow monitoring.

For the aquifer systems underlying the WRIA we have recommendations similar to those for surface water. These recommendations, which are driven by a general scarcity of data upon which to assess baseline conditions and trends, are as follows:

1. Develop a groundwater monitoring plan and strategy.
2. Establish some groundwater level monitoring areas having both high and low well density to better track pumping effects on the 3 aquifer systems and to better characterize potential aquifer recharge conditions.
3. Collect aquifer pumping test data, as it becomes available, to use to better characterize aquifer physical conditions for use in evaluating long term aquifer hydrologic trends.
4. Conduct a limited amount of groundwater geochemical sampling in order to better understand aquifer recharge conditions and evaluate surface water/groundwater continuity.
5. Conduct a more detailed GIS evaluation to inventory and map available data on ground and surface water resources and the relationship to current and future land use in WRIA 53. The goal of such an evaluation would be to collect information useful in identifying aquifer boundaries, recharge areas, high groundwater pumping areas, and potential sustainable aquifer pumping targets, and areas in which potential mining of groundwater is occurring.
6. Compile a GIS layer identifying where potential critical aquifer recharge areas are located.

For planning efforts, the WRIA should:

1. Implement the WRIA 53 Public Participation Plan.
2. Further evaluate the status of land management policies in the watershed.
3. Complete a CARA evaluation for the watershed to identify the susceptible aquifer recharge areas for unconfined systems in the aquifer.
4. Initiate an evaluation of domestic exempt wells to potentially develop a watershed policy of exempt wells, specifically in those areas in which water was documents as being greater than 10,000 years old in the GWMA study.
5. Petition Ecology for removal of the Hawk Creek adjudication from the open adjudication process.
6. Further define groundwater resources in WRIA 53 for the County to develop future code modifications and/or policy for minimum lot sizes and/or housing density.
7. Further discuss and/or evaluate the potential nitrate in groundwater.

In addition to the above outlined recommendations, the Planning Unit should submit the grant application for the optional Water Storage element and further evaluate the potential water storage options for increasing water supplies in the watershed. Integrating the planning effort with the Columbia River Water Management Program should also be conducted.