UMATILLA SUB-BASIN 2050 WATER MANAGEMENT PLAN

08-19-08

UMATILLA COUNTY

CRITICAL GROUNDWATER

TASKFORCE

Umatilla Sub-Basin 2050 Water Management Plan

Report for:

Umatilla County, Oregon

Prepared by:

The Umatilla County Critical Groundwater Task Force

Dates:

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COMMENTS RECEIVED (Full Text of Comments included in Appendix T)

1) **Written comment received from the City of Hermiston on August 1, 2008**
2) **Written comment received on August 7, 2008 from the Oregon Water Resources Department**
3) **Written comment received on October 15, 2008 from Scott Hendricks**
4) **Written comment received on October 15, 2008 from Paul Koch, City Manager, City of Pilot Rock**
5) **Written testimony received on October 16, 2008 from William Quaempts, Confederated Tribes of the Umatilla Indian Reservation**

LIST OF ADDENDUMS

Note: Addendums intentionally left blank as place holders for future updates and supplements

ADDENDUM 1:

ADDENDUM 2:

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PREFACE

The Umatilla County Critical Ground Water Task Force work contained within this report should serve as a key product for a process that began over 10 years ago as the County began its efforts to address and comply with the states water quality and quantity land use goals 5 and 6.

The Umatilla County Planning Commission held a hearing at the National Guard Armory in Hermiston on October 23, 2003 to consider implementing a land use overlay zone in State of Oregon designated Critical Groundwater Areas. This land use overlay zone would have prohibited exempt well development in the majority of west Umatilla County.

Over 540 Umatilla County citizens, including irrigators, rural residents, city residents, scientists and consultants attended the Planning Commission hearing to voice their opposition to the proposed overlay zone. Twenty of the twenty-five individuals who testified in opposition to the proposed overlay requested that Umatilla County establish a local group of citizens to address the wide ranging issues surrounding the water problems in lieu of adopting an overlay zone that would limit a handful of new domestic wells.

Responding to the citizens of Umatilla County, the Planning Commission and Umatilla County Board of Commissioners formed the Umatilla County Critical Groundwater Task Force. The primary goal of the Task Force was to develop and recommend solutions to short and long term water issues in Umatilla County, especially state designated Critical Groundwater Areas. The Board of Commissioners appointed 20 members with diverse backgrounds and dispersed geographical areas within the county to assure broad representation throughout the planning process .

In addition to forming the Task Force, Umatilla County took some time to address their jurisdiction and responsibility as it relates to water quantity and quality. While regulatory oversight regarding water quantity and quality rests with state departments (OWRD and DEQ respectively), Umatilla County has the social responsibility and legal obligation via ORS 195.025 to coordinate planning activities that may affect land uses within its jurisdiction. Based on these findings the BOC developed the charter for the Task Force. The Task Force Charter allowed for the following:

A. Task Force given freedom to establish by-laws
B. Task Force free to think outside the framework of existing laws
C. Task Force given adequate time to educate themselves on issues
D. Task Force given freedom to establish applicable subcommittees

To meet their chartered objectives, The Task Force took the time necessary to collect and discuss an enormous amount of information on the issues surrounding water supply quality, quantity, and water management within the Umatilla Basin. The Task Force began meeting in January of 2004 and finished their first draft of the Umatilla County

Sub-Basin 2050 Water Management Plan on January 18, 2008. The document was revised following five months worth of presentations and public comments.
The four year planning effort included the following benchmarks leading to the final recommendations to Umatilla County:

2004

Task Force organized, established by-laws and set up formal presentations from regulatory entities, cities, water professionals and stakeholders to educate themselves on all of the water issues in the Sub-Basin. The Task Force also addressed the impetus for their appointment (i.e. exempt wells) and adopted an exempt well resolution as an interim policy to guide development during the planning process.

2005 The Task Force developed a Statement of Goals and Principles with common findings and an overview of what would be addressed in the 2050 Plan.

2006 Task Force utilized their education, diverse background and the Statement of Goals and Principles to develop four general concepts to build both short and long-term management alternatives around. The general project concepts that were adopted in 2006 are as follows:

1. Utilize Columbia River Water for replacement of certificated groundwater irrigation rights.

2. Provide Funds for Groundwater Studies to Ensure Water Resource Sustainability.

3. Settlement of CTUIR Water Claims and Maximize benefit of Phase III exchange infrastructure.

4. Develop Policies and Funding Mechanisms to Protect Benefits and Assurances

In the 2007 to mid - 2008 time period the Task Force developed the Umatilla Sub-Basin 2050 Water Management Plan, focusing on the 4 general concepts above. The plan centers on an adopted management goal to gradually recover the basalt groundwater resource. The management alternatives address the four State of Oregon designated Critical Groundwater areas as the priority and utilize the findings, goals and project concepts that were developed between 2004 and 2006 as guidance in developing management alternatives for gradual recovery to be pursued. The key to successful plan implementation is to pursue gradual recovery without degrading surface and groundwater quality, the viability of existing surface water projects, or management agreements that have upheld the intent of the prior appropriation doctrine for many landowners and water users.

The Task Force objectives and proposed plan are intended to serve as guidance developed with known conditions, potential future demands and conditions, and a

preponderance of supporting evidence that suggests these recommendations are sound and can be implemented. It was not the intent of the Task Force or its charter to fully develop these concepts to address **all** regulatory and political processes, or to provide the technical detail that each recommendation will likely require in the on-going collaborative effort to address ground water issues in this basin.

It should be noted that OWRD has placed further administrative adjustments to both water quantity and geographical boundary of the existing CGA's on hold to allow the Task Force the necessary time to produce this plan. Upon completion it is highly likely that the department will update CGA findings using existing sustainable annual yield tools and rule. There is additional economic and environmental risk in taking no action, as evidenced by the outcome of the 1986 task force effort, the continuing demand for an unknown amount of groundwater resources and continuing groundwater declines inside and outside of existing CGA boundaries.

There are four key elements that stand out: 1. Additional and on going scientific study is needed to optimize ground water management tools; 2. New water supply is needed to recover existing water right deficits and support gradual recovery; 3. Funding opportunity and availability are limited and extremely competitive. Without the ability to generate matching funds and a position in the decisions involving the use of these funds the chance for successful implementation is significantly reduced; 4. General agreement must be achieved and sustained between the primary stakeholders in the basin to protect benefits and assurances of project investments within the basin. Lastly, it is important to note that this document will be adopted to help guide and influence county participation in water management issues. This document is not intended to serve as a regulatory document.

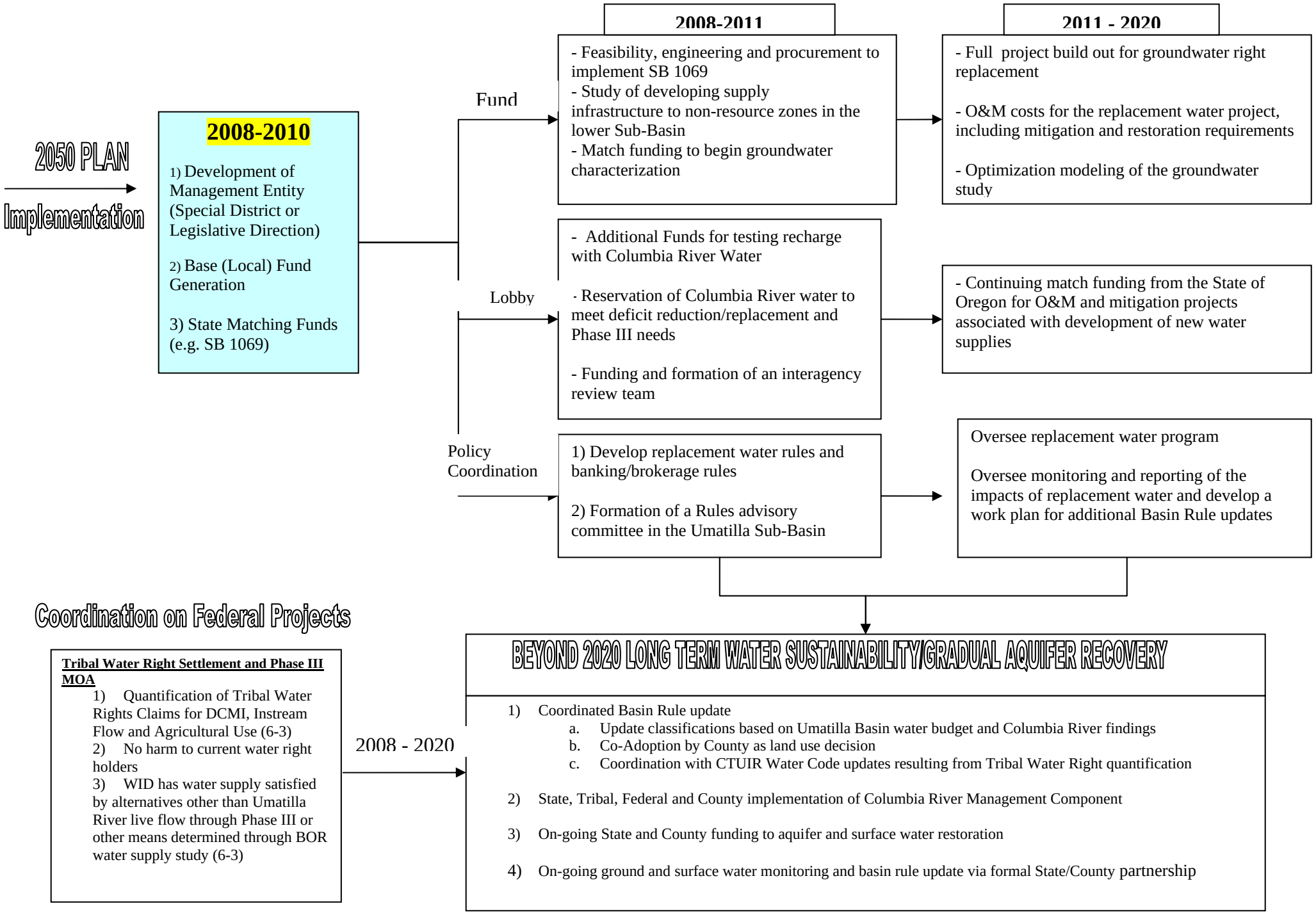
The 2050 Plan is broken out into a series of background sections and one large section that focuses on the recommended management alternatives that should be taken to achieve the gradual recovery goal. Sections one through four of the 2050 Plan provide a background on the impetus for the formation of the 2004 Task Force, past planning efforts in the Umatilla Basin, geography, hydrogeology, water sources and water demands. Sections five and six outline the management scenarios addressed over this five year planning effort, the recommended direction and the recommended management actions. For ease of reading, the top priorities that the Task Force recommends be pursued by Umatilla County over the next three years and a brief timeline of recommended management actions is included in this preface.

Top Priorities for 2008 through 2011

The four CGA's have been the top priority since the development of the Umatilla County Periodic Review Work Plan and the formation of the Task Force. When establishing the mission of the Task Force, the Umatilla County Board of Commissioners explicably stated …"especially in designated Critical Groundwater Areas." The Task Force has addressed this priority in the plan by recommending projects and management alternatives that utilize the four CGA's as the cornerstone for plan implementation. When developing a means for implementation, the Task Force recommends that the CGA's be given top priority.

Utilize the 2009 Oregon legislative session to expand upon the progress made by SB 1069, reserve Columbia River supplies to enable deficit reduction and groundwater replacement to proceed and promote leverage from the State of Oregon to begin moving forward with Phase III and a final settlement of CTUIR water claims. Work through the 2009 session should also include a request for the state to direct staff and funding resources for a Division 33 Interagency Review Team to assist in assuring that any water development benefit improves streamflow and water quality in the Umatilla River during the low-flow period and maintains flow volumes and velocities and water quality fo meet fish needs in the Columbia River.~~,~~, not impact fish and wildlife resources and water quality.

It is also recommended that the county begin negotiations on a Memorandum of Agreement, with the goal of promoting gradual recovery of the basalt aquifer system, to establish a formal decision making body and base funding to carry out the results of SB 1069. The MOA should also include a request to establish a Umatilla Basin Rules Advisory Committee with the purpose of setting up and administering a replacement water/Deficit Reduction Program in the lower Umatilla Sub-Basin and specific Basin Rule updates to limit additional groundwater development until a vetted groundwater budget is completed.


2050 PLAN
Implementation
2008-2010
1) Development of Management Entity (Special District or Legislative Direction)
2) Base (Local) Fund Generation
3) State Matching Funds (e.g. SB 1069)
Fund
Lobby
Policy Coordination
2008-2011
- Feasibility, engineering and procurement to implement SB 1069
- Study of developing supply infrastructure to non-resource zones in the lower Sub-Basin
- Match funding to begin groundwater characterization
- Additional Funds for testing recharge with Columbia River Water
- Reservation of Columbia River water to meet deficit reduction/replacement and Phase III needs
- Funding and formation of an interagency review team
1) Develop replacement water rules and banking/brokerage rules
2) Formation of a Rules advisory committee in the Umatilla Sub-Basin
2011 - 2020
- Full project build out for groundwater right replacement
- O&M costs for the replacement water project, including mitigation and restoration requirements
- Optimization modeling of the groundwater study
- Continuing match funding from the State of Oregon for O&M and mitigation projects associated with development of new water supplies
Oversee replacement water program
Oversee monitoring and reporting of the impacts of replacement water and develop a work plan for additional Basin Rule updates
Coordination on Federal Projects
Tribal Water Right Settlement and Phase III MOA
1) Quantification of Tribal Water Rights Claims for DCMI, Instream Flow and Agricultural Use (6-3)
2) No harm to current water right holders
3) WID has water supply satisfied by alternatives other than Umatilla River live flow through Phase III or other means determined through BOR water supply study (6-3)
2008 - 2020
BEYOND 2020 LONG TERM WATER SUSTAINABILITY/GRADUAL AQUIFER RECOVERY
1) Coordinated Basin Rule update
a. Update classifications based on Umatilla Basin water budget and Columbia River findings
b. Co-Adoption by County as land use decision
c. Coordination with CTUIR Water Code updates resulting from Tribal Water Right quantification
2) State, Tribal, Federal and County implementation of Columbia River Management Component
3) On-going State and County funding to aquifer and surface water restoration
4) On-going ground and surface water monitoring and basin rule update via formal State/County partnership

Section 1
PLANNING PROCESS

1-1 INTRODUCTION

The Umatilla Sub-Basin 2050 Water Management Plan (Water Plan) includes resources and information to help guide water use and influence water management and policy in the Umatilla Sub-Basin.

The purpose of this Water Plan is to ensure a coordinated, integrated response with maximum use of all water resources and to mitigate the effects of water declines impacting Umatilla County. This plan describes, to the extent possible, the core actions to be taken by Umatilla County, coordinating governments, municipalities and cooperating private institutions to respond to groundwater/surface water declines and impacts to groundwater and surface water quality. This Water Plan was written to identify means to prevent future water problems, if possible; and to reduce vulnerabilities and conflicts resulting from current water problems.

Task Force Mission Statement
The Task Force mission is to, "Identify and implement technically and economically feasible measures to enhance and protect groundwater quantity and quality through the year 2050, as an essential natural resource necessary to assure continued economic development in Umatilla County, especially in designated Critical Groundwater Areas."

Task Force Process and Plan Generation
The 2004 Task Force built off of progress made during previous planning efforts and project developments in the Sub-Basin. To meet their chartered objectives, The Task Force took the time necessary to learn all of the issues surrounding water supply and water management in the Umatilla Basin. They began meeting in January of 2004. The following summarizes the Task Force progress through the four year planning effort:

2004

Task Force organized, established by-laws and set up formal presentations from regulatory entities, cities, water professionals and stakeholders to educate themselves on all of the water issues in the Sub-Basin. The Task Force also addressed the impetus for the Task Force (i.e. exempt wells) and adopted an exempt well resolution (Appendix E) as an interim policy to guide development during the planning process.

2005

The Task Force developed a Statement of Goals and Principles (Appendix F) with common findings and an overview of what will be addressed in the 2050 Plan.

2006

The Task Force built off of the Statement of Goals and Principles and developed four general concepts to guide development of short and long-term management alternatives (see Appendix H for the approved concept sheet). The four general concepts include:

- Utilize Columbia River Water for replacement of certificated groundwater irrigation rights.
- Provide Funds for Groundwater Studies to Ensure Water-resource Sustainability
- Settlement of CTUIR Water Claims and Maximize benefit of Phase III exchange infrastructure.
- Protect Benefits and Assurances

2007

The Task Force developed the plan and management alternatives around the concepts adopted in 2006.

Goals and Principles of Plan Development

As stated previously, the 2050 Water Plan is intended to provide locally developed options, actions, and solutions, through coordination and collaboration that will assure adequate and sustainable water supplies to meet broad community and environmental needs in the Umatilla Sub-Basin through the year 2050.

The Task Force used the following guiding principles to develop the 2050 Water Plan and management recommendations found in Section 6 of this document (see Appendix F for the adopted Statement of Goals and Principles):

1.) The purpose of the plan is to assure that water resources are managed in a sustainable manner to meet current and future uses in the Umatilla Sub-Basin. Water quantity and quality will be managed to support and improve economic, environmental, public health, and quality of life conditions in the county.

2.) Plan development will require public outreach and education and the solicitation of input and ideas from the public. Approval and successful implementation of the plan will require broad public support. The Task Force will seek input from members of the public and incorporate such input, when appropriate, in the plan.

3.) Water resources management and permitting is a function of state government, while land-use planning and zoning is a function of the county and city governments. Over-development of groundwater resources in the lower Sub-Basin has restricted further groundwater development in the critical groundwater areas, thereby limiting land uses in those areas. The plan will provide an analysis and recommendations on (A) resolving inconsistencies in state laws/rules that impede integration of water management/permitting and land use regulation and (B) establishing more local control over water management/regulation in Umatilla County, so that the community has more certainty in the availability of water supplies required to meet current and future needs.

4.) There are variable degrees of connection between groundwater and stream flows throughout the Sub-Basin. Water development and use in any part of the basin has the potential to affect water supplies and users in other parts of the basin. The plan will recognize this interconnectedness and consider all water sources in the entire basin to ensure sustainability of groundwater and surface water to meet the current and projected water supply needs.

5.) Sustainable management will require an improved understanding of the annual water budget in the Sub-Basin. Using the best available information, the plan will assess how much water is in the basin, describe its seasonal and spatial distribution, describe its quality and affects of quality on its use, and identify how much is usable on a sustained basis. The plan will identify gaps in the hydrological data/information and the means and methods for acquiring the information.

6.) It is projected that water needs in the Sub-Basin for most beneficial uses will increase through 2050. The plan will describe current uses of water and project future water needs in the basin, including federal reserved water rights. The plan will estimate the quantities needed for the various beneficial uses. The plan will describe the means and methods for protecting and enhancing water supplies so they are available to meet projected needs.

7.) To assure water availability to meet the community's needs, the plan will assess and recommend methods and projects that will improve water supplies and water quality. Recommended projects and actions may include water conservation, aquifer recharge, new surface storage facilities, changes in zoning through the appropriate legislative process, using Columbia River water, water rights transfers and acquisition, changes in laws and regulations, and others. The plan will provide recommendations on funding mechanisms needed for implementing actions and projects and for supporting on-going water resources management programs, including monitoring of water supplies and use, conducting hydrologic studies, and managing land and water use.

8.) The understanding of the Sub-Basin's hydrology, the public's priorities, and water needs will change over time. During the life of the plan, technology and water management tools will change and become available to water managers and users. The plan will be structured for flexibility to accommodate these changes. Periodic review of the plan will need to be an integral part of the 2050 Water Plan to ensure its utility in addressing the water needs and concerns of the citizens of Umatilla sub Basin as we proceed through the 21st century.

9.) The political issues of Sub-Basin water management are not fully understood. The 2050 plan will identify political constraints and opportunities, and propose methods for reaching consensus, such as dispute resolution.

Efforts to Assure a Public Planning Process

The 2050 Plan process was developed to assure public participation during plan generation, review and implementation. The Task Force members were appointed by the

Board of Commissioners to assure a broad representation of the county during the planning process. The Task Force held over forty regular monthly meetings which were open to the public and advertised via an electronic list-serve, posting on the Umatilla County web site and word of mouth by the Task Force and support staff.

In addition to public meetings the Task Force appointed an Outreach Subcommittee to serve as the information body to interested parties, agencies and the general public. The Outreach Subcommittee, by themselves and through an intergovernmental agreement with the Oregon State University, Institute for Water and Watersheds developed a comprehensive outreach approached that included the following:

- Brochures
- Radio and newspaper advertisements
- Task Force web page on the Umatilla County web site
- Groundwater flow model presentations to schools, summer camps and civic groups
- Regular articles in the East Oregonian
- Annual plan updates and reports at the Umatilla County Farm Fair, Umatilla County Fair, Salmon Walk and other local venues
- Regional presentations at water related forums
- A 12 minute educational DVD

To complete the mission to include the public in all aspects of the planning process, the Task Force utilized a third party contractor to conduct a formal local and stakeholder review of the 2050 Plan draft. This review was conducted prior to the Task Force recommending the plan to the BOC. Prior to 2050 Plan adoption the process involves a final round of public notice and public meetings at the Planning Commission and BOC levels.

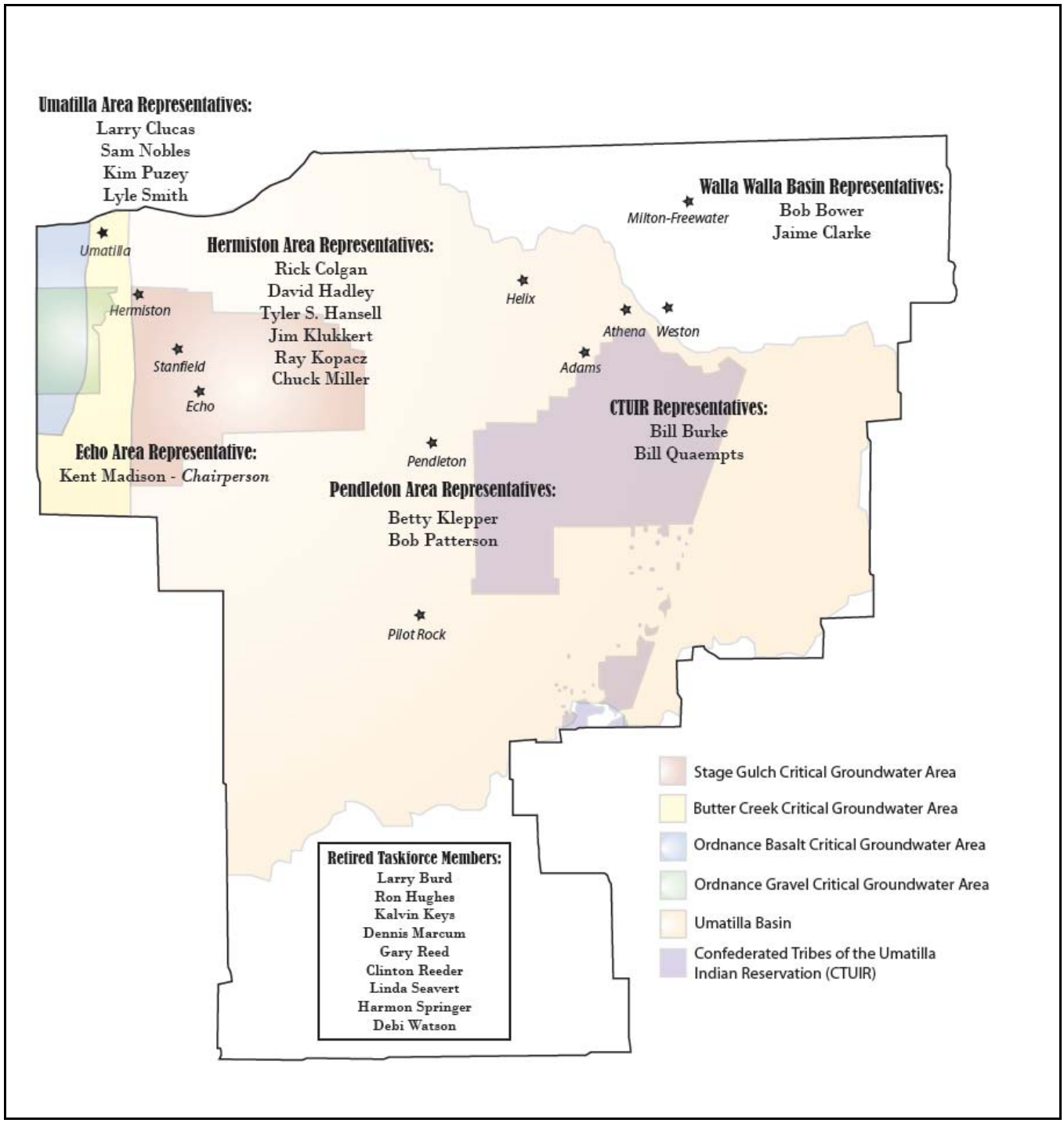


Figure 1: 2004 Task Force and Critical Groundwater Areas within Umatilla County

1-2 PLANNING AREA

In Umatilla County “The Umatilla Basin" as defined in Oregon Administrative Rule (OAR) chapter 690-507 means the area comprised by the Walla Walla River, Wildhorse Creek, Upper Umatilla River, Birch and McKay Creeks, Columbia-Umatilla Plateau, Butter Creek, and Willow Creek subbasins, as shown in Figure 2.

The Umatilla Basin encompasses approximately 2,520 square miles (mi^2) in northeastern Oregon.[1] Because Umatilla County's boundaries are not contiguous with the Umatilla Basin boundaries, the primary planning area covered by this 2050 Plan is that part of the Umatilla River Basin and its tributaries within Umatilla County (Umatilla Sub-Basin). For consistency the planning area is described herein by the term "Umatilla Sub-Basin" (Sub-Basin). Figure 1 provides the location of the Sub-Basin, which is bounded on the north by the Columbia River and Walla Walla River subbasin, on the south-southeast by the Grande Ronde River basin, on the south-southwest by the John Day River basin, and on the west by the Willow Creek subbasin. The Sub-Basin is comprised of two major physiographic regions: the Deschutes-Umatilla Plateau and the Blue Mountains. The Deschutes-Umatilla Plateau located in the northern part of the basin is a broad upland plain formed by vast basalt flows of the Columbia River Basalt Group. The basalt flows dip gently to the north from the base of the Blue Mountains toward the Columbia River. The Blue Mountains form an arched band along the southern and eastern boundary of the Sub-Basin. Elevations in the basin range from about 270 feet above mean sea level (amsl) near the Columbia River to over 5,500 feet amsl in the Blue Mountains.

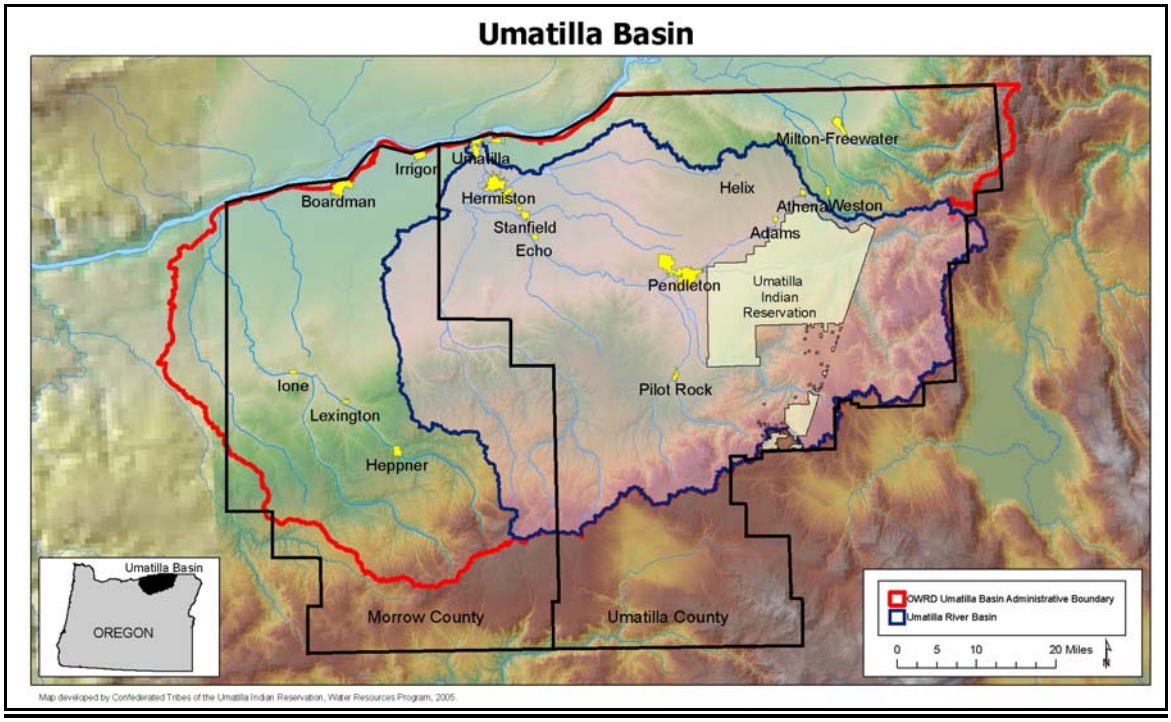


Figure 2: Location of Umatilla Sub-Basin [map developed by CTUIR]

1-3 HISTORY

The Umatilla River Basin has been home to people of the Umatilla, Walla Walla, and Cayuse tribes for thousands of years. These tribes have always believed that cuus (pronounced CHOOSH), or water, is sacred. Both cuus and nusux (pronounced NEWSOOCKS) or salmon are central in their religion. Cold, clean water was needed for all life. It provided habitat for aquatic wildlife and riparian plants which were often sources of materials, food and medicines for Native Americans.

Management of Umatilla Basin water supplies began after the mid to late 1800s when settlers began to use surface water from the Umatilla River to flood-irrigate crops and pasture. Irrigation first began in the Umatilla County area in 1860's, but only in the area's river bottoms. In 1870 Allen Ditch, a Umatilla County resident, secured the first water rights to the Umatilla River. The first agricultural practice in the area was grazing livestock, mostly horses, cattle, and sheep. Later, in 1876, farmers began growing grains.[2] Agriculture, urbanization and diversification have continued and evolved since the early 1800's and have helped to shape Umatilla County and its water use.

The following chronology gives a brief overview of the significant events, water development and management history in Umatilla County:

1855 Treaty with the Walla Walla, Cayuse and Umatilla Tribes and the United States government -- treaty reserved rights for tribes to hunt, fish and gather traditional foods

1859 Treaty ratified by Congress

1862 Umatilla County created by state legislature

1862 Irrigation begins in Umatilla County

1864 City of Umatilla incorporated

1880 City of Pendleton incorporated

1880-1920 population increase

1882 Union Pacific Railroad arrives

1890 Umatilla Meadows and Butter Creek Canal Company organized to enlarge and extend ditch diverting water from Umatilla River to irrigate land across the river from Echo -- becomes Hinkle Ditch Company

1893 Intention of Water Use (first State of Oregon water allocation law)

1903 Bureau of Reclamation (BoR) begins investigations to determine feasibility of irrigating lands around the Umatilla River

1903 Gaging station established on Umatilla River -- two miles upstream from mouth of the river

1903 Hinkle Ditch Company begins irrigating land south and east of

Hermiston by diverting water from Umatilla River

1905 Furnish Ditch Company begins construction of system to irrigate several thousand acres near Stanfield by diverting water from Umatilla River. Irrigon Dam completed

1906 BoR construction of projects begins after Congressional approval

1907 City of Hermiston incorporated

1908 Winters v. United States (legal basis for reserved water rights for tribes)

1908 Hermiston Irrigation District created

1908 Cold Springs Dam and Reservoir, Feed Canal Diversion Dam and Feed Canal completed -- to supply supplemental irrigation water to the Hermiston Irrigation District

1909 Furnish Dam completed

1910 First Pendleton Round-Up

1912 Maxwell Diversion Dam completed

1913-17 Three Mile Falls Diversion Dam and West Extension Main Canal built to provide water to West Extension Irrigation District

1916 Adjudicated decree of water rights to use waters of Umatilla River and its tributaries (1953 supplemental findings and order of determination identified inchoate rights to be allowed)

1917 West Extension Irrigation District created

1920 - 1940 Population and economic decline (summer water shortages and soils unsuited for irrigation). Decline in irrigated acreage continued until 1949, when trend reversed

1925 First well (125 feet) in Butter Creek area

1926 State fish and wildlife experts report that there were no chinook or coho left in the Umatilla River

1927 McKay Dam and Reservoir completed -- to supplement water supplies for Stanfield and Westland Irrigation Districts

1938 Bonneville Dam completed

1940 BoR Pendleton Project initiated

1940 - 2000 Population increase due to Federal projects (Umatilla Depot, McNary Dam construction) and manufacturing/processing plants

1941 Umatilla Military Reservation established. Operated as onsite explosive washout plant from 1950s to 1965

1942 300' well drilled at Ordinance Army Depot

1949 - 1959 Alfalfa production

increases 45% (more irrigated alfalfa and less non- irrigated grass land)

1950s Irrigation from groundwater begins

1951 BoR report on McNary Gravity Investigation concluded to no irrigation facilities were required in McNary Dam and recommended additional study of potential irrigation development areas in the Plymouth Bench area

1952 First deep well (554 feet) in Butter Creek Area (deepened to 840 feet in 1961)

1954 Pendleton Project Investigation by BoR. Identified several plans for storage and utilization of surplus Umatilla River waters. Concluded that potential irrigable land far exceeded available water supply. No plans were financially feasible in terms of full repayments of reimbursable costs within 40 years (report released locally as an information document to aid local planning)

1955 Oregon Groundwater Act: No water rights needed for stockwatering, irrigating lawns or non-commerical gardens of 1/2 acre, for single or group domestic purposes not exceeding 15,000 gallons per day , or for single industrial or commercial purpose not to exceed 5,000 gallons per day

1958 First reports of water table decline in Butter Creek area

1959 BoR determines available water storage based on adjudicated rights and permits on the Umatilla River

1960 Groundwater level monitoring begins in Butter Creek area

1960s Groundwater levels dropping in Battle Creek

1963 BoR report on possible Birch Creek Diversion Unit -- reanalyzed canal plan and concluded construction still unwarranted

1963 OWRD produces map showing location of 480 sub-basin water rights; reports on scarcity of groundwater and minimal recharge

1963 OWRD reports that fish life will probably take an increasing non-consumptive use of water in the Umatilla River

1963 ODFW conducts survey of steelhead and chinook spawning habitat on the upper Umatilla River

1964 Based on local and state concerns, BoR begins study to provide comprehensive analysis of multiple-purpose development potential on basin-wide scale (results published in 1970)

1964 Oregon Water Resources Commission adopts Umatilla Basin program

1966 Groundwater use for center pivot irrigation begins

1966 Congressional authorization for Secretary of the Interior to conduct feasibility investigation to expand irrigation base and address anadromous fishery needs in the Umatilla Basin

1969 BoR constructs pumping plant on Columbia River to lift water into West Extension Canal

1970 BoR reports that any significant increase in pumping from basalt aquifers would likely result in accelerated decline of water tables

1972 72 irrigation wells in Butter Creek area (depth 665-1500 feet)

1972 Federal Clean Water Act

1973 Oregon Senate Bill 100 signed by Governor McCall. Creates Oregon statewide planning program with the Land Conservation and Development Commission (LCDC) and the Department of Land Conservation and Development (DLCD).

1974 Oregon LCDC adopts 14 statewide planning goals

1974 Eastern Central Oregon Association of Counties completes Regional Water System Feasibility Study for Hermiston-Boardman, Oregon

1975 Port of Umatilla proposes a regional water system based on their permit for the project of 155 cfs from the Columbia River

1976 OWRD designates Butter Creek a Critical Groundwater Area (remanded until 1986)

1976 Critical Groundwater Area designated by OWRD for Ordnance Basalt

1976 Critical Groundwater Area designated by OWRD for Ordnance Gravel

1977 Lost Lake/Depot well owners initiated project to artificially recharge shallow gravel aquifer using existing canal system

1980 CTUIR initiates Umatilla Salmon Recovery Project

1980 ODFW initiates a steelhead supplementation program

1980s Coalition formed between CTUIR and local irrigators to recover salmon populations -- BoR, BPA, OWRD and ODFW participate

1980 ODFW begins hatchery outplanting program on Umatilla River to supplement natural production

1983+ Umatilla County Comprehensive Plan recognizes that availability of water is a key resource for economic growth

1983 ODFW and ODEQ submit minimum streamflow requirements for Umatilla Basin to State Water Resources Board

1984 Umatilla Chemical Depot placed on EPA's National Priorities List because of soil and groundwater contamination

1984 Formation of Umatilla Basin Project Steering Committee

1985 Umatilla River and tributaries withdrawn from further appropriation by Oregon Water Resources Commission and minimal perennial stream flows adopted by Umatilla River and Birch Creek

1985 Umatilla Basin Fish Resource Improvement Committee (UBFRIC) adopts plan. Developed in cooperation with CTUIR, ODFW, National Marine Fisheries Service, Fish and Wildlife Service, BoR and Forest Service (funding for plan from BPA)

1986 Critical Groundwater Area designated by OWRD for Buttercreek Basalt

1986 Report to the Governor, Umatilla Basin Ground Water Task Force (identifies water use concerns and suggests alternatives)

1987 Oregon Instream Water Rights Act -- recognizes instream uses as beneficial

1988 Umatilla Basin Project authorized and funded by Congress (developed by CTUIR and irrigators coalition -- allows irrigators to exchange Umatilla River water for Columbia River water)

1988 Oregon Water Resources Commission approves Oregon Water Plan: Umatilla Basin Sections

1989 Oregon Groundwater Quality Protection Act

1990 Classified Groundwater Area designated by OWRD for Ella Butte (exempt uses only)

1990 ODEQ declares 352,000 acres in Umatilla and Morrow counties as a groundwater management area (GWMA) after discovering elevated levels of nitrates in wells -- leads to the Lower Umatilla Basin GWMA Voluntary Plan

1991 Critical Groundwater Area designated by OWRD for Stage Gulch Basalt

1991 OWRD enforces compliance against waterspreading

1992 Oregon DEQ and EPA conduct sampling to characterize regional groundwater quality -- Lower Umatilla Basin identified as area of elevated nitrate in groundwater

1994 Salmon return to the Umatilla River (first time in seventy years)

1994 1994 Oregon passes an Aquifer Storage and Recovery bill (ASR) (Check the date to be sure)

1995 Columbia River Intertribal Fish Commission (CRITFC) develops

anadromous fish restoration plan for Columbia River Basin

1997 Oregon Plan for Salmon and Watersheds

2003 Umatilla County ranked fifth in state in agricultural commodity sales at $200 million

2003 Oregon Water Resources Department report published -- Ground Water Supplies in the Umatilla Basin

2003 Aquifer Storage and Recovery (ASR) Pilot Testing in the City of Pendleton

2004 Umatilla County Critical Groundwater Task Force created by the Umatilla County Board of Commissioners in order to develop a "2050 Plan" to assure adequate groundwater for broad community needs through the year 2050

2004 Northwest Power and Conservation Council (NWPCC) adopts Umatilla Subbasin Plan

2005 Umatilla County Board of Commissioners adopt Exempt Well Resolution until 2050 plan is authorized

2006 Farmers in the Butter Creek basin start utilizing AR to ASR technology to recharge the critical area

1-4 PREVIOUS BASIN PLANNING EFFORTS

The Umatilla Basin Project

Reclamation engineers began investigating the Umatilla Project in the spring of 1903 and began coordinating with the State of Oregon in 1905 after the passage of the Oregon Irrigation Act. The original project was planned and built in stages over approximately 30 years.

The Umatilla Basin Project currently provides approximately 17,000 acres with surface water from the Umatilla River or from the Columbia River through a bucket-for-bucket exchange program implemented in the 1980's and 1990's. The Umatilla Basin Project also provides approximately 13,000 with supplemental surface water supplies and approximately 3,800 acres with water through McKay Reservoir storage contracts. An extensive irrigation system network provides the storage, direct supply and exchange network necessary to meet irrigation demands and fishery needs in the Umatilla River. Figure 3 provides a general overview of the irrigation districts, storage system, main infrastructure system and Columbia River pumping infrastructure developed in the multiple phases of the Umatilla Basin Project.

The Umatilla Basin Project is now considered one of the most successful anadromous fisheries restoration projects completed by the BoR. Extensive coordination and collaboration amongst the BoR, CTUIR, State of Oregon, Special Districts and water users has assured a successful restoration effort without impacting existing BoR water users in the lower Sub-Basin. Planning and coordination continue amongst federal, tribal, state and local entities to optimize Umatilla Basin Project water to meet multiple needs of the Sub-Basin. This process has led to the philosophy of "do no harm" in the Sub-Basin, which balances fishery needs with consumptive needs in a manner that benefits all users. The Umatilla Basin Project and philosophy has been a cornerstone during the development of the Water Plan. A thorough overview of this process can be found on the BoR website, http://www.usbr.gov/dataweb/html/umatilla.html, and many of the BoR studies that have investigated as part of this planning process can be found in Appendix J.

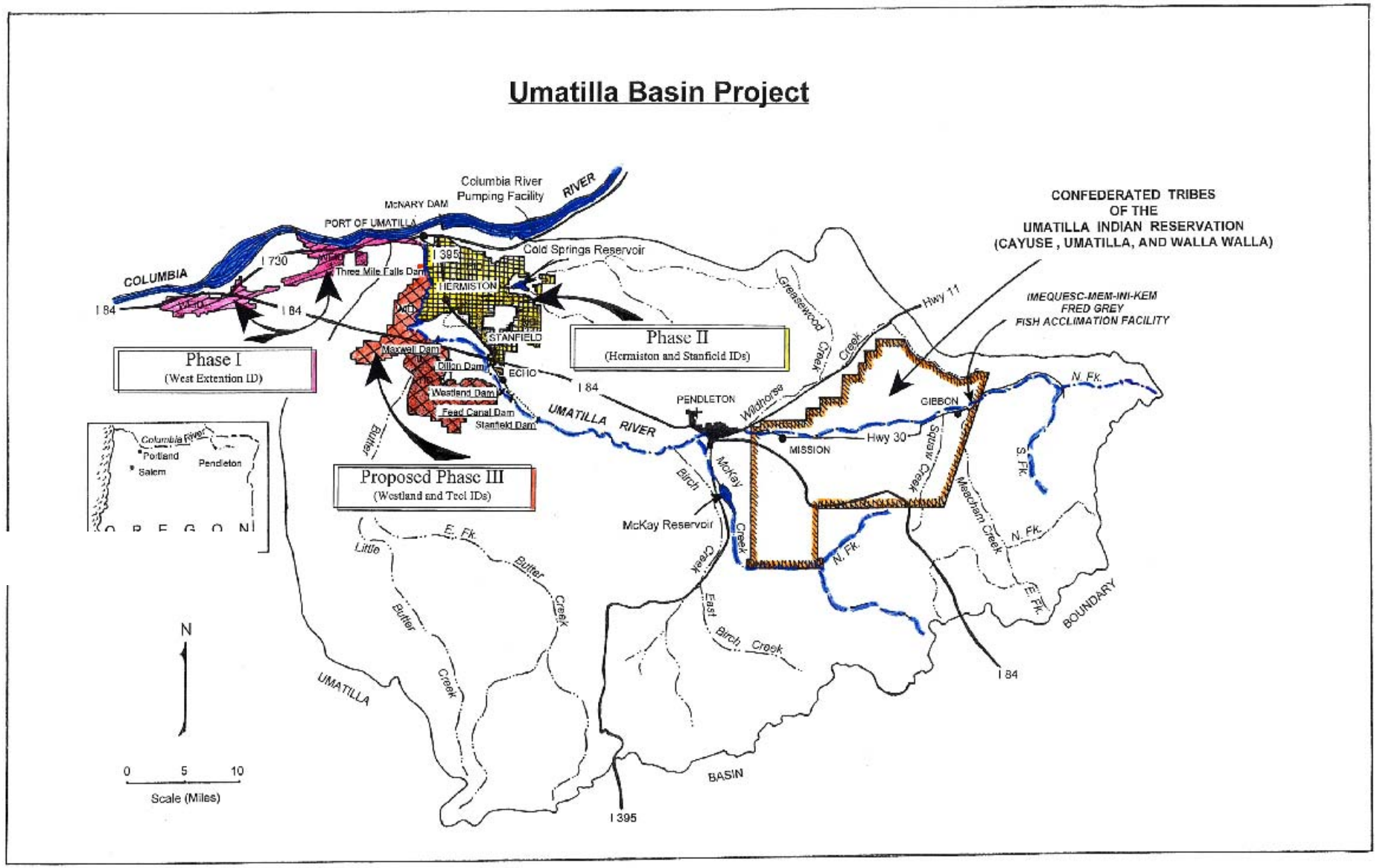


Figure 3: Umatilla Basin Project Infrastructure (CTUIR)

The 1985 Umatilla Basin Groundwater Task Force

On February 18, 1985 Governor Victor Atiyeh signed Executive Order #EO-85-3 establishing a fifteen member Umatilla Basin Groundwater Task Force. The 1985 Task Force was charged with "investigating and recommending alternative ways of providing water to meet the needs of agriculture while protecting water for domestic use and stock watering."[3] The 1985 Task Force consisted of the following individuals:

- Charles R. Norris, Chairman
- Lawrence B. Rew, Secretary
- Hadley C. Akins
- Tyler S. Hansell
- Michael E. Henderson
- John F. Madison
- Donald N. Mills
- Antone Minthorn
- Jerry E. Meyers
- Gerald L. Odman
- William I. Porfily
- Chester J. Prior
- Glenn L. Rohde
- Hartley T. Seeger
- Kenneth J. Turner

The 1985 Umatilla Basin Task Force was a group of citizens with a lot of knowledge about ground and surface water supplies in the Umatilla Basin. They utilized the first six months of meetings for background presentations on existing water problems and possible solutions. During that time the 1985 Task Force recognized that groundwater supply problems for irrigation could not be solved without addressing all water supply needs on a basin wide scale.

After meeting for one year the 1985 Task Force completed a final report and on May 30, 1986 issued their final report to Governor Atiyeh (the full report can be found in Appendix K). The 1985 Task Force recommended the following to meet current and future water demands in the Umatilla Basin:

- Support passage of legislation to allow groundwater permits relating to recharge
- Continuing support of the Umatilla Basin Project to enhance streamflow and restore anodromous fish populations in the Umatilla River
- State and relative parties provide coordinated, comprehensive water planning in the Umatilla Basin. Water planning to be provided similar to the effort that was undertaken by the Bureau of Reclamation
- The Governor support formation of a Umatilla Basin Water Management Group to carry out the recommendations of the Task Force

The plan recommendations included in the 1986 report to the governor provided a strong starting point for the 2004 Task Force to begin crafting the 2050 Plan. The 2004 Task Force also addressed the reasoning behind why these recommendations were not implemented. It was found that the primary reason for lack of implementation was that no formal entity or grouped formed to keep the momentum moving both locally and at the state and federal levels.

1988 Umatilla Basin Report

The Umatilla Basin program was first adopted in 1964 to guide water rights permitting in the Umatilla Basin. Irrigated agricultural development, food processing, water restoration projects and groundwater declines, amongst other things, prompted the WRC to update the Umatilla Basin program in 1988. A planning process and report, the Umatilla Basin Report, was developed as a support document for the update of the Umatilla Basin program rules (Umatilla Basin Rules are included as Appendix B).

The purpose of the report was to promote "coordinated, multi-agency, water planning as an alternative to single-purpose planning by multiple agencies[4]" and focused on six water policy issues (Note: the 1988 Umatilla Basin Report can be found in Appendix L):

1. Municipal Water Supply and Quality
2. Interstate Cooperation on Water Management
3. Instream Flow Needs
4. Out-of-Stream Use
5. Water Quality
6. Watershed Management

Each of the six water policy issues included in the report provided background information and included ranked recommendations for the WRC, OWRD and other jurisdictions to pursue in order to meet the intent of the report.

This report gives a good account of the many facets of water management that must be coordinated to assure a holistic water management approach. The report, background and recommendations are currently out of date and OWRD has not been provided the necessary funds to continually update basin reports and plans.

Comparisons between Umatilla Basin Project, 1985, 1988 and 2004 Planning Efforts

The 2004 planning effort is one of four efforts to develop and implement water management alternatives to optimize Sub-Basin water supplies. The 2004 planning effort has also identified a lot of similarities in the conclusions of all four efforts. Generally, these similarities are as follows:

- The CTUIR has an unquantified water rights claim in the Sub-Basin that must be addressed
- Water supplies developed through Columbia River pumping, surface storage, conservation and recharge can meet identified water needs and can be developed under multi-beneficial use scenarios (i.e. recharge projects could benefit irrigation, industry, exempt and fishery needs)
- New projects and regulatory updates should be designed to minimize impacts to existing projects and users (i.e. do no harm)
- Implementing improvements requires on-going planning, coordination and oversight at the Sub-Basin level
- Some changes in state water law may be necessary to implement viable options to optimize water supplies for all needs, including environmental needs, in the Sub-Basin
- Basin scale water planning and policy formation is the best way to manage available water supplies to fit site specific needs

Section 2
WATER GOVERNANCE

Sub-Basin water governance is managed by multiple federal, state and local agencies, tribal agencies, ports, and irrigation districts. These entities have specific missions relating to everything from Columbia River dam and hydroelectric system management to local land use planning (figure 4 identifies some of the agencies involved in Sub-Basin water governance). With so many entities and agencies involved in water management, coordination is often complex and difficult when developing long range plans or implementing large and small scale water management projects.

Figure 4: Sub-Basin Water Governance Jurisdictions

This section is intended to give an overview of the jurisdictions that may influence the implementation of the 2050 Plan. Not all jurisdictions are identified but it will be necessary to develop strong lines of communication and coordination with all water related jurisdictions to assure effective implementation of the 2050 Plan.

It has been difficult to understand the governance picture for water supply planning and regulation in the State of Oregon. To help gain a better understanding of the responsibilities in the State of Oregon, Umatilla County staff developed a water governance matrix. The governance matrix was reviewed by the OWRD, DLCD and their respective counsels to help clarify the responsibilities regarding water planning and regulation. Comments received from OWRD and DLCD confirm that OWRD has sole regulatory authority over water management and water use but that counties do have the responsibility to coordinate planning activities within their jurisdiction and assist in

promoting wise management policies. Additionally, counties have the responsibility to develop comprehensive plans that address the carrying capacity of resources and that protect significant natural resources, including water resources (see OWRD/DLCD letter included as part of Appendix S).

2-1 Federal Government

The primary Federal entity involved in Sub-Basin water management is the United States Bureau of Reclamation (BoR). Reclamation's O&M Program focuses directly on the need to maintain reliable storage and delivery and efficient use of water resources in the Western United States to support existing economies, sustain production of agriculture, provide water for municipal and industrial purposes, and where consistent with other project purposes, flood control.[5]

Federally owned Umatilla Basin Project facilities are operated by the BoR. McKay Reservoir and Cold Springs Reservoir are operated by the Bureau of Reclamation, as are the Phase I water exchange facilities and those Phase II facilities which deliver exchange water to Cold Springs Reservoir and to the North Branch Furnish Canal. The other water exchange facilities which were a part of the original project are operated by the irrigation districts.

Coordination with the BoR will be required due to the fact that some recommended projects propose to utilize federally owned Umatilla Basin Project infrastructure. A Federal Warren Act contract may also be necessary if Federal infrastructure is utilized to provide water to lands that were not included in the Umatilla Project or Umatilla Basin Project authorizations (i.e. “non-project lands”).

The Warren Act was passed in 1911 and allows BoR to enter into contracts for conveyance and storage of “non-project” water through project facilities. The Warren Act was amended in 1922 to allow contract water to be utilized for uses other than irrigation in California and Nevada. Since Oregon was not included in the Warren Act amendments of 1922, contract water in the Sub-Basin would need to be utilized for irrigation which is what the Umatilla Basin Project was authorized for by congress.

2-2 Tribal Government

Three programs under the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) Department of Natural Resources are involved in water or water related governance on and off of the Umatilla Indian Reservation. The Task Force coordinated closely with most of these agencies during the development of the plan to assure future coordination, encourage partnership and minimize conflict should the plan action items move forward. The missions of the CTUIR Department of Natural Resources and its water related programs are as follows:

CTUIR Department of Natural Resources

The Department of Natural Resources will protect, enhance and restore the natural and cultural heritage of the CTUIR by ensuring the long-term health, availability, wise-use, and production of the Tribes natural resources in a manner consistent with cultural values and sound management.

Environmental Planning and Rights Protection Program

The mission of the Environmental Planning and Rights Protection Program (EPRE) is to provide planning and policy analysis and development to protect and restore the First Foods and the exercise of associated rights reserved in the Treaty of 1855. Secondarily, EPRP will implement on-going Environmental Protection Agency-funded projects until portions of such functions are transferred and combined with Range and Agricultural Programs.

Water Resources Program

The mission of the Water Resources Program is to ensure that ground and surface waters are available to satisfy CTUIR treaty rights, the needs of CTUIR members, and the citizens of the Umatilla Indian Reservation. Water Resources will accomplish this by implementing CTUIR Water Code procedures and regulations to promote sustainable water use and management. The CTUIR also has authority under the Tribal Water Code (adopted in 1981) to issue water permits on the Reservation.

CTUIR Water Code

In 1981, the CTUIR began regulating water development and use on the Reservation, under the CTUIR Water Code. The Water Code requires everyone who wants to construct a well and develop water on the Reservation after August 5, 1981, to obtain a permit from the CTUIR Department of Natural Resources.

Since the late 1970s, the CTUIR have been aware of the expanding groundwater depletion problems in the basalt aquifer in the lower Umatilla River Basin, in the vicinity of Pendleton, and in the Athena area. Understanding that the basalt aquifers under the Reservation are similar to the aquifers under the lower Umatilla Basin, the CTUIR have been concerned that development of groundwater on the Reservation would deplete the aquifer, which could impact drinking water supplies and economic development on the Reservation.

In the CTUIR Water Code, which sets out the standards and procedures for acquiring water use permits, the CTUIR have implemented water-use standards to try to address the limitations on the ability of the basalt aquifer to supply water on a sustainable basis. One standard is the limitation of allowing one acre-foot of basalt groundwater to be applied per irrigated acre per year. Another standard is capping the pumping limit at 900 gallons per minute from any basalt well and restricting the withdrawal from any basalt well to a maximum of 200 acre feet per

year. In the Mission area of the Reservation, the Water Code limits the pumping rate from irrigation wells to a maximum of 25 gallons per minute and a maximum annual withdrawal of 5 acre-feet per year. Through these regulations, the CTUIR are attempting to prolong the water supply in the basalt aquifer, to spread the supply around to as many people as possible, and provide water to as many beneficial uses as possible. However, the CTUIR also addresses a need for more information on how much groundwater can be pumped and pumping locations would not cause significant declines.

Fisheries and Wildlife Programs

The Fisheries and Wildlife agencies of the CTUIR report directly to the Fish and Wildlife Commission and are charged with the missions to provide sustainable harvest opportunities for aquatic species of the First Food order by protecting, conserving, and restoring native aquatic populations and their habitats and to provide sustainable harvest opportunities for big game species of the First Food order by protecting, conserving, and restoring big game populations and their habitats. Secondarily, the Wildlife Program will investigate opportunities for restoring harvestable populations of native game birds to the Umatilla Indian Reservation and aboriginal use area.

2-3 State Government

Oregon Water Resources Department

According to Oregon's water laws (Title 45 of the 1993 edition of the Oregon Revised Statutes), all surface water and groundwater belong to the public. The Water Resources Commission (WRC) of the State of Oregon has authority over water supply and allocation of the state's water resources.[6] The Oregon Water Resources Department (OWRD) is the state agency responsible for the administration of the laws and carrying out the policies and rules of the Water Resources Commission

Water rights recognized in the Sub-Basin by the State of Oregon fall into several different categories. These include water rights filed in the 1916 Final Decree for the Umatilla River (1916 Decree) (Umatilla County Courthouse) and water use permits and water cright certificates issued since by OWRD. State law allows certain "out-of-season" water withdrawals and recognizes but does not require a water use application for certain "exempt" uses of water. Under certain situations, OWRD recognizes the inter-connection of groundwater and surface water sources and will classify and regulate use of hydraulically connected groundwater as surface water.

Therefore, any water management project implemented as a result of this plan must be closely coordinated with the OWRD and WRC.

Oregon Department of Environmental Quality (DEQ)

Amongst other responsibilities, DEQ is the state agency that is responsible for protecting and enhancing Oregon's surface and ground water quality.

DEQ administers local water quality programs and has the authority to operate federal environmental programs within the state such as the Federal Clean Water, and Resource Conservation and Recovery Acts. The Federal authority has been delegated to DEQ by the United States Environmental Protection Agency.

Close coordination with DEQ when implementing this plan is necessary to assure that the standards of the Clean Water Act are met and that management projects enhance, rather than degrade, surface and ground water resources.

Oregon Department of Land Conservation and Development (DLCD)

Oregon's statewide land-use planning program originated in 1973 under Senate Bill 100. The statewide land use planning program is administered by the Department of Land Conservation and Development (DLCD) and is intended to provide protection for farm and forest lands, conservation and orderly development of natural resources, orderly and efficient development, coordination among local governments, and citizen involvement.[7]

Under the program, all cities and counties have adopted comprehensive plans that meet mandatory state standards. The standards are 19 Statewide Planning Goals (14 of which apply east of the Cascade Mountain Range) that deal with land use, development, housing, transportation, and conservation of natural resources. Two goals (Goals 5 and 6) deal directly with planning for ground and surface water quantity and quality, but 11 of the 14 applicable statewide planning goals address the need for the state to consider the adequacy of water supplies and the status of water quality when reviewing planning decisions. Specifically, the Statewide Planning Goals and Guidelines state "consider as a major determinant the carrying capacity of the air, land, and water resources of the planning area. The land conservation and development actions provided for by such plans should not exceed the carrying capacity of such resources.[8]"

Even though DLCD does not play a direct role in the regulation of water quality and quantity, they have the responsibility to assure that land use plans and local decisions address the carrying capacity of water resources.

2-4 Local Government

Counties and cities are responsible administering their local Comprehensive Plans and Development Codes, which incorporate the 14 Statewide Planning Goals addressed above. Counties are also required to coordinate all of the planning activities within the confines of their respective county boundaries. Specifically, "(1)…[a county's] governing body, shall be responsible for coordinating all planning activities affecting land uses within the county, including planning activities of the county, cities, special districts and state agencies, to assure an integrated comprehensive plan for the entire area of the county.[9]"

Section 3
SURFACE AND GROUNDWATER RESOURCES

3-1 Hydrologic and Geologic Setting

From about 16-million years ago to about 10-million years ago, massive volcanic eruptions spewed lava from fissures in the Earth's crust. About 300-separate lava flows poured out of the earth and cooled into basaltic rock during this time period. Since each flow can range in thickness from 3 to 300-feet, the total thickness of all the flows can be greater than 10,000-feet.[10] These rocks, the remnants of those enormous eruptions, are collectively referred to as the Columbia River Basalts (CRB).

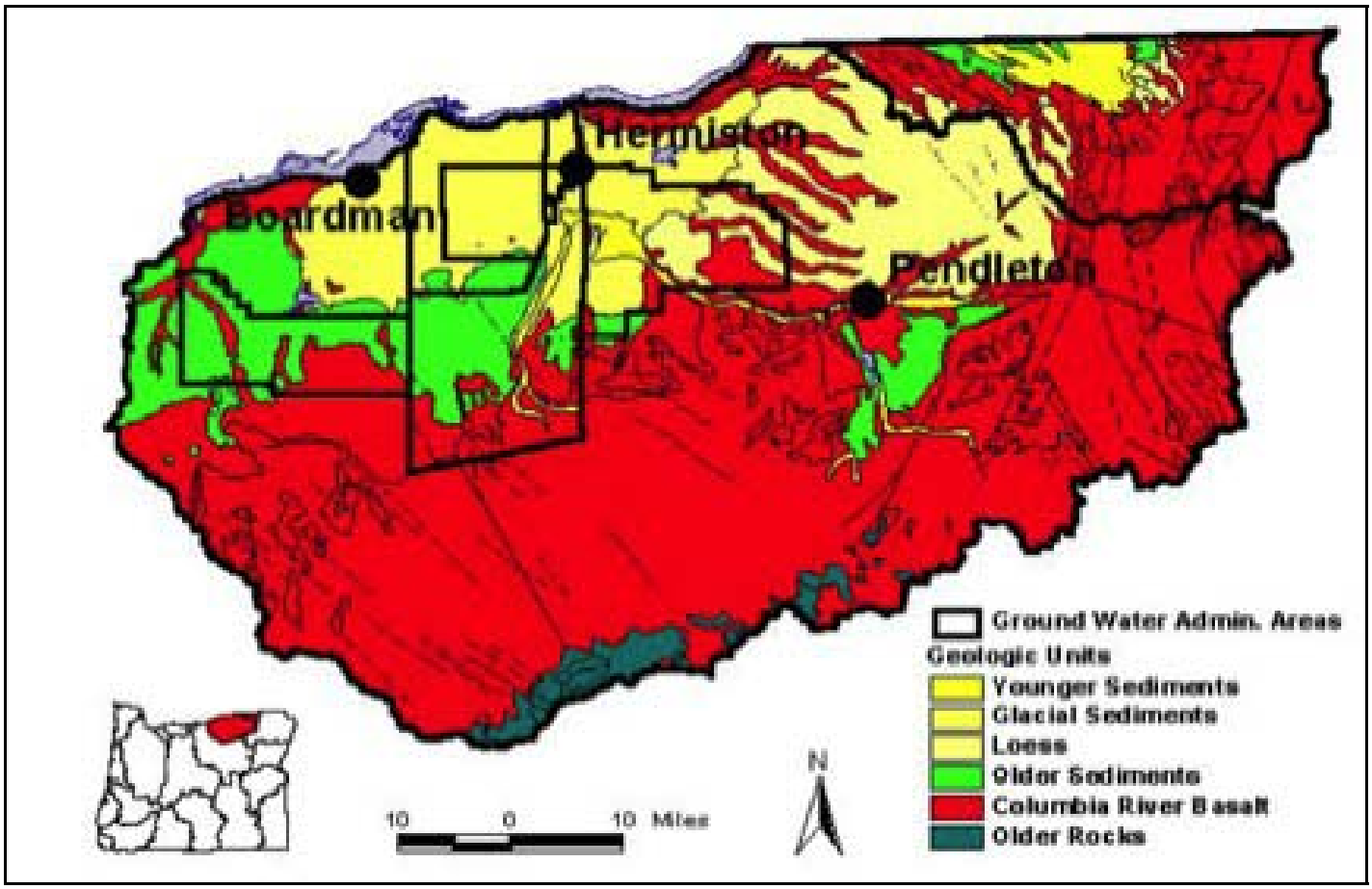


Figure 5: Simplified Geology of the Umatilla Basin (OWRD, 2003)

In the time between CRB flows, weathering and erosion broke up the top layer of the hard, black basalt; as new flows surged over the old, they created layers of breccia, or rubbly, broken-up rock. Sedimentary deposits are also present between some basalt

flows. These layers were formed during periods of volcanic inactivity, when streams, lakes, and soil horizons formed on the basalt surface.[11] While the middle of each basalt flow is dense and transmits little water, the interflow zones of breccia and sediment form productive aquifers.

Around the same time that the Columbia River Basalts were being formed, regional uplifting began creating the Blue Mountains. Basins and uplands began to form, rivers and streams began to run, and in some places, the running water left sands, gravels, and boulders, materials known as alluvium. These places, past riverbeds and flood deposits, are today's alluvial aquifers.

3-2 Surface Water Resources

Sub-Basin surface water resources include the Umatilla River and its tributaries, as well as The John Day and McNary Pools of the Columbia River (Note: the Columbia River is within the Columbia Basin by definition but water supplies from the Columbia River are utilized for many beneficial uses in the Sub-Basin). In addition to the flows of the Columbia River, Umatilla River and various tributaries, there are two federally managed surface storage reservoirs (McKay and Cold Springs) that store spring run-off for use during the crop growing season.

Umatilla River and Tributaries

The Umatilla River Basin covers an area of about 2,545 square miles. The Umatilla River originates on the slopes of the Blue Mountains at nearly 5,500 feet in elevation and flows about 90-miles from the confluence of the North and South Forks in a generally westward direction to the Columbia River (OSU, 2006). The main stem Umatilla River has eight major tributaries: The North and South Forks of the Umatilla River and Meacham Creek in the upper Basin; Wildhorse, Tutuilla, McKay and Birch Creeks in the mid-Basin; and Butter Creek in the lower Basin. The Umatilla River and tributaries to the Umatilla River are shown in Figure 6.

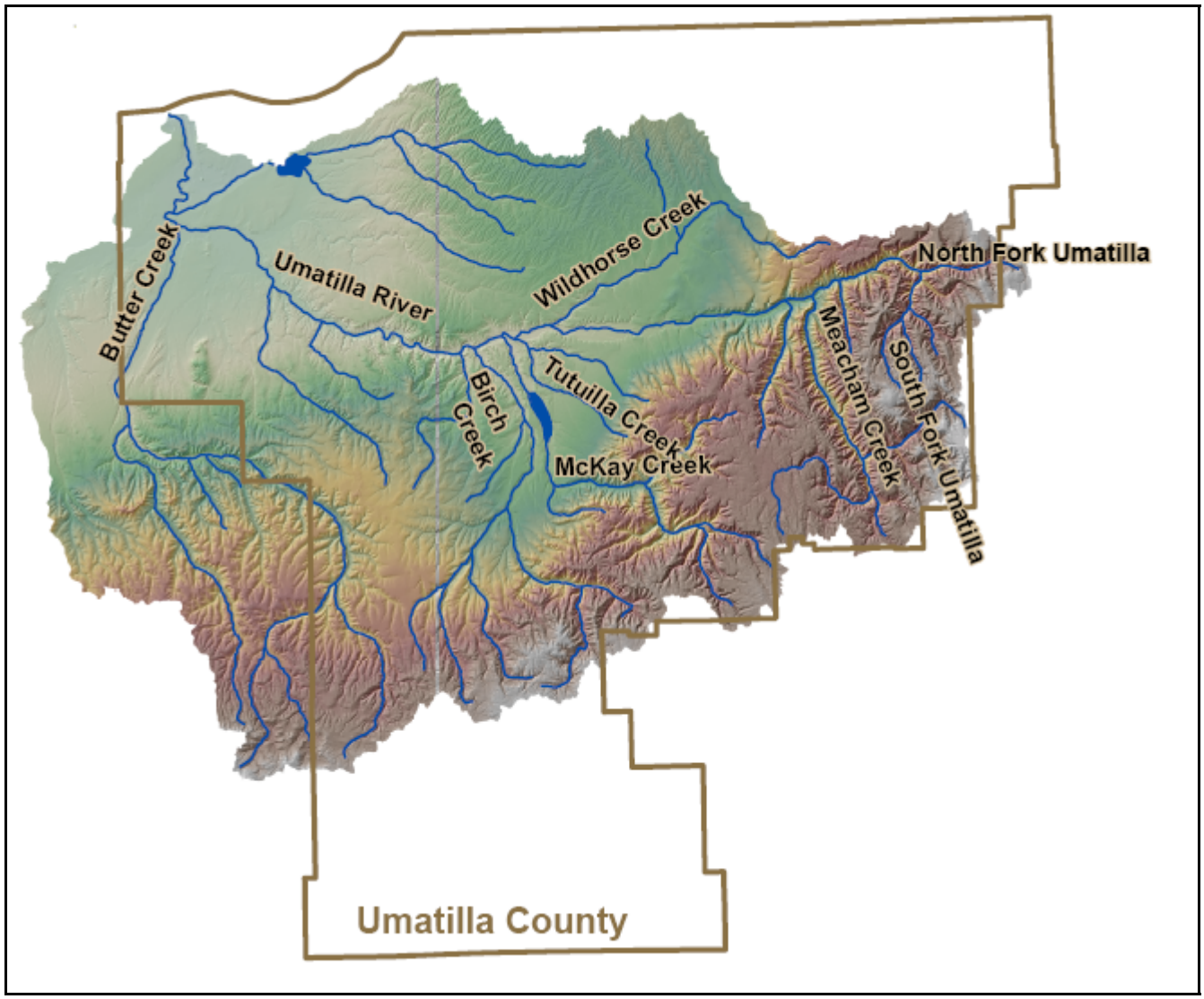


Figure 6: Umatilla Basin Watershed

Flows in the Umatilla River are heavily dependent on winter snowpack, as characterized by high peaks during the early spring and often extremely low flows in the summer. This hydrologic pattern is shown in Figure 7 for water years 1999 through 2001 at the USGS gauging station UMAO, which is located near the mouth of the Umatilla River (river mile 2.1) or confluence with the Columbia River. Average monthly discharge at UMAO varies from 20 cubic feet per second (cfs) in July to 1,478 cfs in April (figure xx) for the period of record of 1930-1997.[12] The average annual discharge of 474 cfs is lower than the natural discharge due to summer diversions for irrigation. The average annual discharge at the Yoakum gauging station (YOKO, river mile 37) is 675 cfs. Figure 8 shows the average monthly discharge for UMAO for the period 1930-1997.[13]

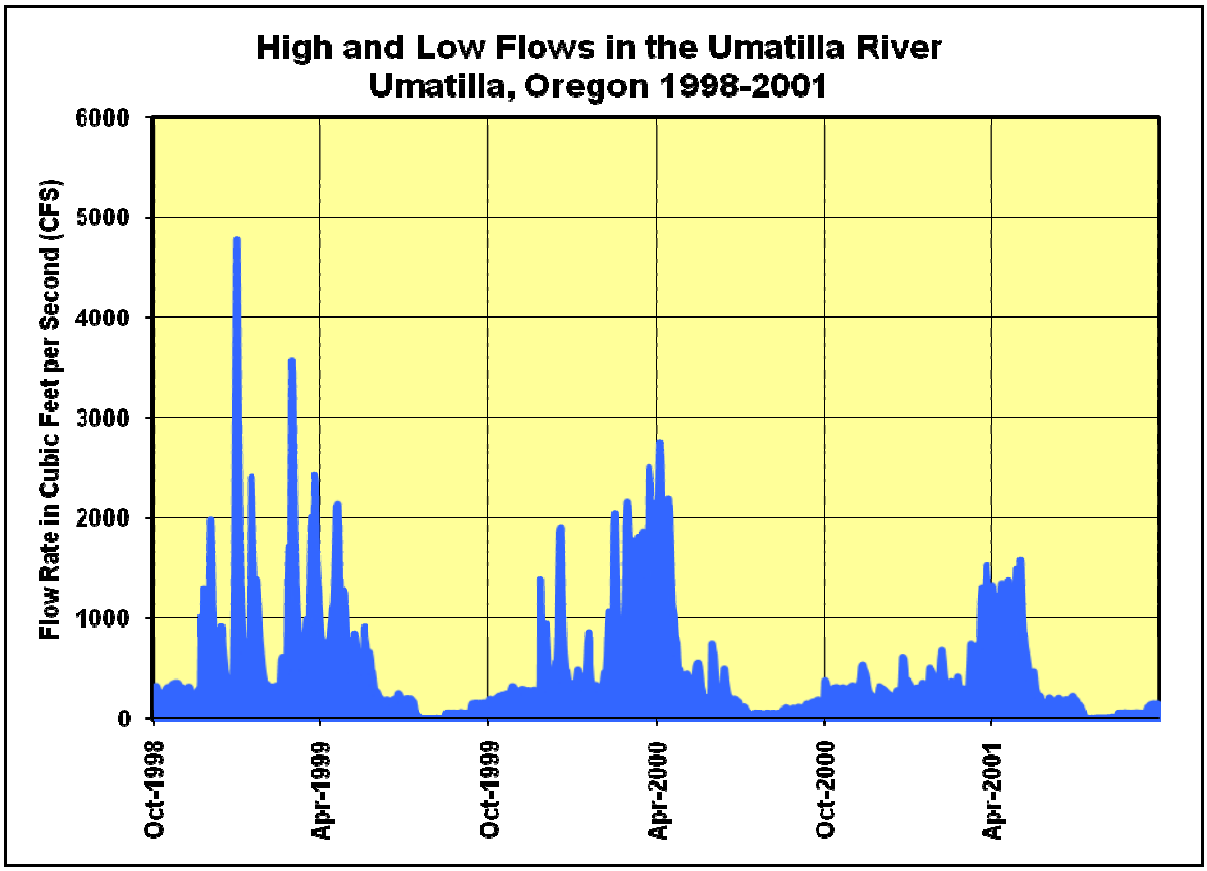
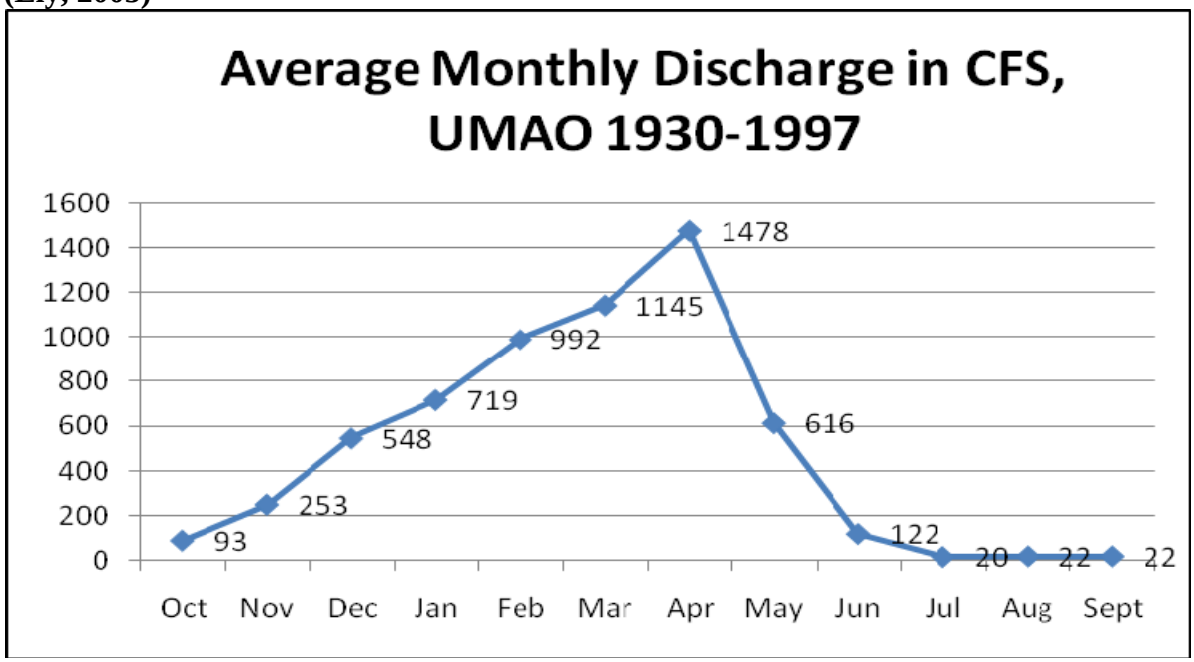


Figure 7 and 8 - Daily discharge in the Umatilla River near the confluence with Columbia River at river mile 2.1 for the water years 1999 through 2001 and monthly discharges at UMAO from 1930 to 1997. Note that the hydrologic pattern is highly variable showing a strong correlation to winter snow pack and run-off (Ely, 2005)



Columbia River

Significant attention has been placed on the Columbia River as a means of addressing the water problems in the Sub-Basin. Therefore, an overview of the Columbia system and Columbia Basin water management is provided in this plan.

The Columbia River system is one of the largest and greatest water system in the western United States and is a major asset to the economics and culture of Umatilla County and the CTUIR. The Columbia River has an annual runoff at its mouth of about 198 million acre-feet and an average flow of 275,000 cubic feet per second.[14] This makes the Columbia River the second largest river system in the United States in runoff.

The Columbia River Basin encompasses approximately 260,000 square miles and contains waterways that cover approximately 3,000 square miles and inundate approximately 260,000 acres (figure 9). Two countries, multiple states and multiple federal, sovereign, state, local and private interest groups and agencies have an interest in the Columbia River

Figure 9: Columbia River Basin (BPA)

The Columbia River is managed by federal, state and sovereign agencies for nine primary uses:

1. Flood control
2. Fish migration
3. Fish and wildlife habitat
4. Electric power generation
5. Navigation
6. Irrigation
7. Recreation
8. Municipal and Industrial water supply and quality
9. Cultural resources

Based on the complexity of Columbia River management, the true availability of Columbia River water supplies to the Sub-Basin is currently unknown. OWRD has established Columbia Basin Rules that dictate when water supplies can be diverted out of the Columbia River, for what uses and if mitigation requirements may be necessary. These rules are codified under OAR 690 Division 33.

3-3 Groundwater Resources

The Sub-Basin has two distinct groundwater systems with variable forms of connectivity between each other and with surface water resources. The two systems are know as alluvial aquifer and basalt aquifer systems.

Alluvial Aquifers

In general, the alluvial aquifer is unconfined but locally can be confined by less permeable clay layers.

Recharge is from natural and artificial sources. Natural recharge occurs from the limited amount of precipitation that falls in the lower basin and from hydraulically connected surface-water sources (e.g. stream losses and floodplains). Artificial recharge occurs from the application of surface water and other sources for irrigation and from leaky irrigation canals that percolate into the groundwater system. Another source of recharge is from artificial groundwater recharge (AR) projects. AR projects are designed specifically to recharge alluvial aquifers for consumptive and/or environmental benefit. One AR project, the County Line Water Improvement District (CLWID) for the Ordnance gravel aquifer located west of the Umatilla River in the lower Sub-Basin, is the first known AR project in the State of Oregon.

Discharge from the alluvial aquifer is also by both natural and artificial processes. Natural discharge occurs to hydraulically connected surface-water bodies, springs, subsurface outflow, and a minor amount to vegetation through evapotranspiration. Artificial discharge occurs through withdrawals by pumping. Another potential, though

currently unevaluated, source of artificial discharge is through leakage to the underlying basalt aquifers

Basalt Aquifers

In general, wells tapping the basalt aquifers are semi-confined to confined. In areas where groundwater levels have declined below the confining unit, the aquifer is unconfined. According to Davies-Smith and others (1988), the interflow zones in the CRBs tend to be highly permeable in the horizontal direction, which is parallel to the interflow zone.

Due to the dense interior of the individual basalt flows, however, the vertical permeability between the interflow zones probably is limited to just a few sporadic open fractures.

Because of the limited thickness of the interflow zone, transmissivity tends to be low, and consequently, water wells are commonly drilled through more than one interflow zone to attain the desired yield. Due to the high permeability of the interflow zones, some wells produce more than 2,500 gallons per minute (gpm) with a high specific capacity. OWRD treats the basalt aquifer as a regional groundwater reservoir rather than individual aquifers for each of the interflow zones in the Columbia River Basalt Group.

Aquifer testing by OWRD in the lower basin and by CTUIR in the upper basin has indicated numerous vertical hydrologic barriers in the basalt aquifer. These barriers to a large degree determine the rate and movement of groundwater from recharge areas to discharge areas. They can act as a "bottleneck" to groundwater flow.

Recharge to basalt aquifers is primarily from precipitation in the higher elevations of the Blue Mountains. Very little recharge is known to occur in the lower. Consequently, recharge to the basalt aquifer is very slow and takes many years to reach the lower Sub-Basin. OWRD sampled groundwater in the basalt aquifers to determine age by Carbon age-dating techniques (indicates when water was last exposed to earth's atmosphere) and found that groundwater is youngest near the Blue Mountains and oldest adjacent to the Columbia River. Dates were reported as young as 2,570 years in Pendleton and as high as 27,250 years in the lower Sub-Basin.

As discussed above, with declining water levels in the basalt aquifer, recharge may also occur by gravity drainage from the alluvial aquifer above. Discharge from the basalt aquifer occurs naturally to springs (local flow system) and to a lesser degree to the regional-flow regime and artificially to wells.

Overview of Local (Sub-Basin) Groundwater Conditions

Groundwater stored in the basalt aquifers is generally limited to interflow layers (or in rubble zones) between basalt flows. The basalt layers overlying the rubble zones is typically less permeable than the rubble zones, and the water in the aquifer is pressurized. In some cases, the pressure in the aquifer is sufficient that historical drilling into it creates flowing, artesian wells (wells with static water levels above land surface).

Recharge to the basalt aquifers occur primarily in the Blue Mountains, where precipitation is highest, and where permeable interflow zones are exposed at the surface by the tilting of the geologic layers. The water may either flow directly into the interflow zones, or (more likely) down through the faults and into the interflow zones. Areal infiltration of precipitation and snowmelt in the Blue Mountains is probably the most significant source of recharge, vs. selective recharge through permeable zones. Faults are likely to be barriers to recharge and flow.

3-4 Water Quality

Surface Water

Several water quality concerns have been identified in Sub-Basin streams and rivers. A basin-wide TMDL[15] study specifies maximum allowable pollution levels and the amount of improvement needed to address these water quality impairments: *temperature, pH, dissolved oxygen, bacteria, nitrate and fine sediment*. The study and its associated management plan, both co-sponsored by the Oregon Department of Environmental Quality (DEQ), Confederated Tribes of the Umatilla Indian Reservation and the Umatilla Basin Watershed Council, also address habitat and stream flow issues.

Temperature and fine sediment are the most widespread concerns, being virtually basin wide. Both jeopardize cold-water fish and other beneficial uses of Basin waters. The temperature TMDL allocates maximum heat loads to agriculture, forestry, transportation and urban land-use sectors. The allocations are then translated to effective shade and channel width objectives. In order to reduce river and stream temperatures, streamside vegetation, particularly trees, is called for along the entire length of perennial streams and the Umatilla River. Channel width will reduce as riparian vegetation stabilizes the banks and more so as streams and rivers are allowed more space for sinuosity and flooding.

The TMDL objectives for fine sediment take the temperature analysis a step further, quantifying erosion reduction targets for stream banks and uplands through roughly ninety percent of the Basin area. Increased in-stream delivery of fine sediment results from removal of natural land cover and changes in runoff intensity as impervious surface area expands. Fine sediment is detrimental to aquatic life through in-filling salmon and trout spawning gravels and water column abrasiveness and opacity.

The other water quality issues are more localized. Nitrate exceeds water quality standards only in the Wildhorse Creek watershed. Excess nitrate should be addressed through fertilizer application/fate controls and decreased stream exposure to livestock and runoff. Bacteria exceeds water quality standards in the mid and lower basin watersheds: McKay, Wildhorse, State Gulch, Birch, Tutuilla, Butter Creeks and the Speare Canyon and Hermiston areas. Reduced bacteria delivery should be accomplished primarily through modified management activities in relation to livestock. Urban runoff and

inadequate septic systems should be addressed as well, though most human sources have already been reduced relative to animal usage, or occupy less land area.

During the summer, dissolved oxygen and pH undergo large daily fluctuations in the Umatilla River between Pendleton and Echo. TMDL modeling has shown that pH can be addressed through implementation of the temperature TMDL. Reduced heat and light through stream-shading limits daily algal growth and its associated daily cycling of oxygen and CO_2, moderating both pH and dissolved oxygen. Though it has not yet been demonstrated, it is likely that dissolved oxygen is addressed sufficiently through temperature TMDL implementation as well.

Other potential water quality impairments in the Umatilla River and its tributaries include dissolved iron and manganese; however, these have not yet been studied.

Solutions

The TMDL goals are challenging and have implications for existing and future development of housing, industry, roads, farms and other enterprise and infrastructure. Several management measures can address a wide range of pollutant and habitat concerns. Stream shade, space for sinuosity and flooding, upland erosion reduction and farm & runoff management address every identified water quality concern and improve aquatic habitat. Deq has recommended that new development provide for riparian buffer area, and minimize erosion, runoff and impervious surface, throughout the Sub-Basin. DEQ has also recommended that existing development undertake best management practices and restoration activities. Substantial technical and financial assistance are available through state and federal entities to meet these recommendations.

Time Trend

The Oregon Water Quality Index provides a single number representing surface water quality that aggregates several indicators – temperature, dissolved oxygen, pH, bacteria, etc. The long-term trend (3 decades) is improving at four assessed sites: the Umatilla River at Yoakum, Pendleton and Hermiston; and McKay Creek below the Reservoir. These sites still range from poor to very poor index values.

Shallow Alluvial Aquifer

The primary water quality concern in the shallow alluvial aquifer in the Umatilla Basin is nitrate. [16] A study of the lower basin conducted in the early 1990s identified five potential sources of nitrate loading to groundwater:

- Confined animal feeding operations
- Irrigated agriculture
- Land application of food processing water
- Rural residential development (septic systems, lawns and gardens, wells, and pastures), and
- Umatilla Chemical Depot Washout Lagoon.

An advisory committee made up of State Agency representatives and local citizens took the study and developed the December 1997 Lower Umatilla Basin Groundwater Management Area Action Plan. The goal of the Action Plan is to seek solutions to protect the area's groundwater. Recommended solutions should, within a reasonable time, bring the level of nitrate in the groundwater back below the 7 mg/l level that triggered the declaration of a Groundwater Management Area (GWMA). Figure 10 displays the boundaries of the GWMA within the Sub-Basin.

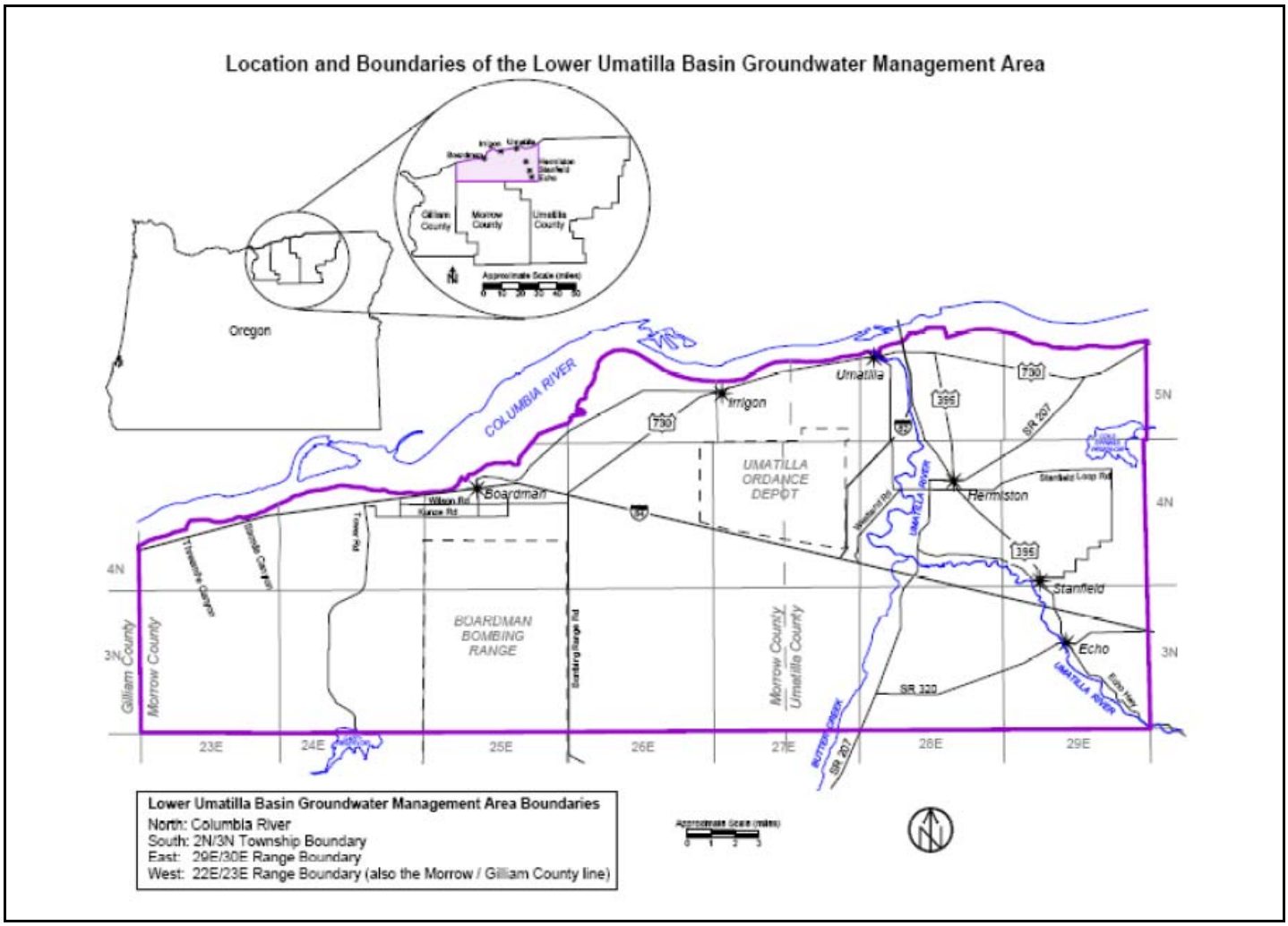


Figure 10: Lower Umatilla Basin Groundwater Management Area (ODEQ)

The LUBGWMA Action Plan

The Action Plan recommends general activities and specific tasks to be conducted by involved agencies and groups representing the five sources of nitrate loading. Some of the recommendations include:

- Confined animal feeding operations – Properly manage surface water runoff, wastewater effluent, solid manure and feedyard surfaces.
- Irrigated agriculture – Conduct proper nutrient and irrigation management.

- Land application of food processing water - Conduct proper nutrient and irrigation management.
- Rural residential development – DEQ and local governments should develop a process to take into consideration the cumulative effects of septic systems. Individuals should conduct proper nutrient and irrigation management of landscaping, lawns, and gardens, repair inadequately constructed wells, keep contaminants away from existing wells, and practice proper manure management techniques.
- Umatilla Chemical Depot Washout Lagoon – maintain the groundwater treatment system designed to remove explosives such that the nitrate-laden water does not spread further into the aquifer. With the discontinued operation of the Bomb Washout Plant and cleanup of the contaminated soils, the source of the groundwater contamination has been removed.

It was agreed to generally promote a voluntary approach for addressing the groundwater contamination in the area. This voluntary effort complements the required implementation of water quality permit-based controls for specified sources, through DEQ.

Measurement of Action Plan success is conducted every four years. If after a scheduled evaluation point, DEQ determines that the voluntary approach is not effective, then mandatory requirements may become necessary. Progress will be based on the evaluation criteria outlined in the Action Plan.

Timeline

The Action Plan calls for an area-wide trend analysis at the end of 2009 (12 years after adoption of the Plan). Even though this analysis has not yet been conducted, other analyses have been conducted which indicate nitrate concentrations are not yet improving. These include the following:

- Comparison of 1992 and 2003 synoptic sampling events – Large sampling events were conducted in the GWMA during 1992 (207 wells) and 2003 (137 wells). Data from these events were analyzed several ways, and each way indicates that most wells show increasing nitrate trends from 1992 through 2003.
- Area-wide trend using GWMA well network – DEQ monitors a network of about 38 wells every other month. The data from this well network will be used for the area-wide trend analysis at the end of 2009. Data from this network were used to calculate an area-wide trend from 1998 (the first sampling event since adoption of the Action Plan) through 2004. The results show a statistically insignificant flat trend. In other words, with a low degree of confidence, it was concluded that there was no change in concentrations between 1998 and 2004.
- Food processor land application sites – Nitrate data have been collected from wells located upgradient of, within, and downgradient of where food processing wastewater is used for nutrients and moisture to grow crops. These data have been analyzed twice. An analysis of data from 113 wells from the time of well installation through 2001 showed most wells exhibited increasing nitrate trends.

Similarly, an analysis of data from 127 wells from the time of well installation through 2005 showed most wells exhibited increasing nitrate trends.

3-5 Water Quality Relationships – Surface and Ground Water

When water levels in a stream are above the level of adjacent groundwater, surface water can infiltrate from a stream channel into the adjacent groundwater aquifer. When this occurs, the section of stream is called a "losing reach". This condition can occur during times of high stream flows (typically winter and spring). The opposite occurs when the stream level is lower than the ground water table: groundwater can flow out of an aquifer into an adjacent stream channel. When this occurs, the section of stream is called a "gaining reach". Stream gaining typically occurs during the summer months when precipitation and runoff are low, and streams are at their lowest level. When this occurs, groundwater is said to provide "base flow" to streams.

The relationship between surface water (quality and/or quantity) and groundwater (quality and/or quantity) is difficult to summarize because it is dependent on site-specific conditions and the question being asked. Generally, these relationships are stronger and better understood with regard to the shallow alluvial aquifer. Therefore, the following discussion will be in the form of questions and responses specific to the shallow alluvial aquifer – other than to say that, with regard to the deeper basalt aquifers, there is likely some connection with surface water, and that connection is potentially important, and efforts to protect these deep aquifers clearly benefit the basins hydrologic resources in a number of ways having to do with quality and quantity.

Do ground water quality and/or availability influence surface water quality?
This question largely involves availability. Surface water quality impairment in the Umatilla River and its tributaries is most dramatic in the warm season. During this time, streams are supplied almost exclusively by shallow groundwater base flow. Suspended solids concentrations and temperature/DO/pH cycling are less in ground than in surface water. Accordingly, the more supply of groundwater and surface/subsurface exchange, the better the stream water quality. Additionally, enhanced stream flow from increased ground-to-surface water movement results in a decreased solar heating effect – thus benefiting stream water quality with reduced summer temperature and pH/DO cycling. Conversely, depletion of the shallow aquifer (naturally or via wells or ditches) can drain the stream, adversely affecting stream water quality and quantity. The stream benefit of high shallow water tables is predominant throughout the basin.

Bacteria can be introduced to streams directly or through runoff or groundwater, but slow pore-space travel time and rapid die-off generally buffers groundwater sources. Accordingly, increased ground to stream flow leads to instream bacteria reduction, more often than not.

The fact that shallow groundwater can enhance stream water quality begs the question – "does poor groundwater quality then result in poor stream water quality?" Fortunately,

this is generally not true. This is because severe pollutant sources are typically localized, and introduction of ground water to the stream occurs gradually along much of its length, diluting local effects. However, the excess nitrate in Wildhorse Creek may provide a rare exception, where high nitrate from ground water sources is documented (e.g., Athena Springs). Upper reach water in Wildhorse Creek dilutes this input such that surface water concentrations are less than that of sources such as Athena Springs, yet the surface water still occasionally exceeds the water quality standard of 10 mg/l. This serves as an example of how soil nitrogen can be flushed to streams, and provides a cautionary note to artificial recharge systems.

Do surface water quality and/or availability influence ground water quality?
In the Umatilla basin, surface water quality is typically as good, or better than groundwater quality from a drinking water perspective. The most widespread surface water contaminants (temperature and fine sediment) pose little problem in the groundwater system. Therefore, when streams lose water to the shallow alluvial aquifer, groundwater quality is typically improved. However, when a stream loses water to groundwater, the effect is typically limited to the portion of the aquifer relatively close to the stream. So the influence of surface water quality on groundwater quality is not widespread.

Does artificial recharge of alluvial aquifers decrease concentrations of contaminants in native groundwater, thus increasing quality?
Water leakage from irrigation canals and ditches recharges the alluvial aquifer in certain areas of the basin. Canal leakage rates are high enough to dilute local groundwater and reduce nitrate concentrations in those localized area. Local irrigation districts have begun a program to improve their water delivery systems by decreasing canal leakage rates. Reducing leakage rates would provide less recharge water to dilute nitrate concentrations. Nitrate concentrations may increase in certain areas as dilution water becomes less abundant.

The effect of artificial recharge on alluvial aquifer water quality depends on the quality of the source water, the quality of the receiving water, and the quality of the material through which the source water travels (i.e., the unsaturated zone). If the source water quality is good and if the unsaturated zone contains low levels of contaminants, the groundwater quality and quantity can be improved. If, however, the source water quality is poor or the unsaturated zone contains significant contamination, the groundwater quality can be degraded. Potential contaminants of concern typically include bacteria, nutrients, pesticides, petroleum hydrocarbons, and metals. Also, artificial recharge projects in areas with septic systems could cause problems if the water table was raised enough to interfere with the operation of the septic systems.

There are likely locations within the Umatilla Basin where site conditions (i.e., high quality source water and unsaturated zone) would allow artificial recharge projects that could benefit groundwater quality and quantity. For example, properly operated artificial recharge projects located in areas with high groundwater nitrate concentrations could both reduce nitrate concentrations through dilution and increase groundwater velocity,

helping to wash nitrates through the aquifer faster. The Action Plan encourages the development of recharge projects using excess winter and spring flows where such projects would be beneficial in meeting the goal.

If properly located and operated, artificial recharge projects also have the potential to benefit surface water quality and quantity. For example, locations may exist where surface water could be diverted and recharged during the winter and return as cool base flow during the summer.

Section 4
SURFACE AND GROUNDWATER USE

4-1 BACKGROUND

All water rights which post-date the 1909 Water Code were required to first receive a permitted water right prior to using water. Water rights which predate the Water Code are decreed rights (vested and inchoate) and recorded in the 1916 Decree for the Umatilla Basin.

Water rights in the Sub basin have been issued for the beneficial uses of irrigation, municipal, domestic, stock, power, and industry. The irrigation season is defined as March 1 through November 1 (however, the growing season is typically six months per year). The rate and duty[1] allowed under a water right are determined by soil type and location of site within the basin. In the Sub basin, rates range from one eightieth to one fortieth of a cfs per acre, and the range of duty is three to six acre-feet per acre. The capacity of the delivery system that delivers the water also provides a limit factor on the the maximum rate water can be delivered. Typically, ground water rights have a maximum rate of one eightieth of a cfs per acre rate and three ac-ft per acre duty.

Water may be appropriated for beneficial uses when it is available. For example, "out-of-season" uses are allowed for filling reservoirs, groundwater recharge, irrigation to increase soil moisture and industrial uses. In the Umatilla River basin, at least 563 cfs can be attributed to off-season irrigation water rights: 350 cfs to the Hermiston Irrigation District to divert water to Cold Springs Reservoir; 75 cfs to the County Line Water Improvement District for groundwater recharge; and 138 cfs to the Teel Irrigation District for soil moisturization.

Uses of surface water that are "exempt" from application for a water right include stock watering; fish protection, fire control, forest management, land management practices and rainwater collection.[17] Uses of groundwater that are "exempt" from application for a water right include stock watering; one-half acre of lawn or non-commercial garden watering; single or group domestic purposes not exceeding 15,000 gallons per day; single industrial or commercial purposes not exceeding 5,000 gallons per day; down-hole heat exchange uses, and watering of school grounds ten acres or less at schools located within a critical ground water area.[18]

According OAR 690-507-0070, for the Columbia-Umatilla Plateau Subbasin, the Umatilla River and tributaries (surface water) are withdrawn from further appropriation of unappropriated water during the period June 1 through October 31 each year. However, withdrawals for exempt uses, storage, groundwater recharge, power development, and pollution abatement are possible from November 1 through May 31.

[1] Duty is defined here as the total volume of water that can be applied per acre (ac-ft/ac) during an irrigation season.

4-2 CURRENT WATER RIGHT DEMANDS

All of the surface and groundwater resources addressed in Section 3 of this plan are utilized for both consumptive and non-consumptive uses throughout the Sub-Basin. This section provides a brief and very general overview of water demand throughout the Sub-Basin based on the best available information provided by OWRD and other sources. Multiple appendices (i.e. appendices K, L, M, N, O, P, and Q) have been included with this plan to provide a more thorough overview of ground and surface water demand. In addition to the existing data, multiple studies are currently underway to further analyze existing water demand data and quantify current and future water demands in the Sub-Basin.

Surface Water

All surface water sources in the Sub-Basin have been withdrawn by OWRD from further appropriation for the period of June 1 through October 31. Since the only two large surface water storage projects in the Sub-Basin are owned by the Federal Government, few options exist for the diversion and storage of water during the available period (November 1 through May 31). Based upon these withdrawal dates, storage through surface water impoundments, aquifer recharge and aquifer storage and recovery would need to be developed if available surface water supplies were to be utilized during the summer and fall months when water demand is highest.

Currently, OWRD estimates that surface water rights in the Sub-Basin total approximately 802,667 acre-feet of primary and approximately 258,400 acre-feet of supplemental surface water demand. This excludes instream and minimum flow rights and existing applications that are in various stages of state processing or that have not been perfected. The perfected surface rights are broken out as follows and reflected in Figures 12 and 13.

- Primary Irrigation – 474,860 acre-feet
- Supplemental Irrigation – 258,400 acre-feet
- Primary Other Uses – 327,807 acre-feet

Ground Water

Groundwater aquifers, both alluvial and basalt, have been continually exploited by all beneficial uses since the early 1900's. The peak of groundwater development occurred in the mid 1970's but groundwater continues to be developed at a rate of +/- 100 wells per year in the Sub-Basin (see figure 11).

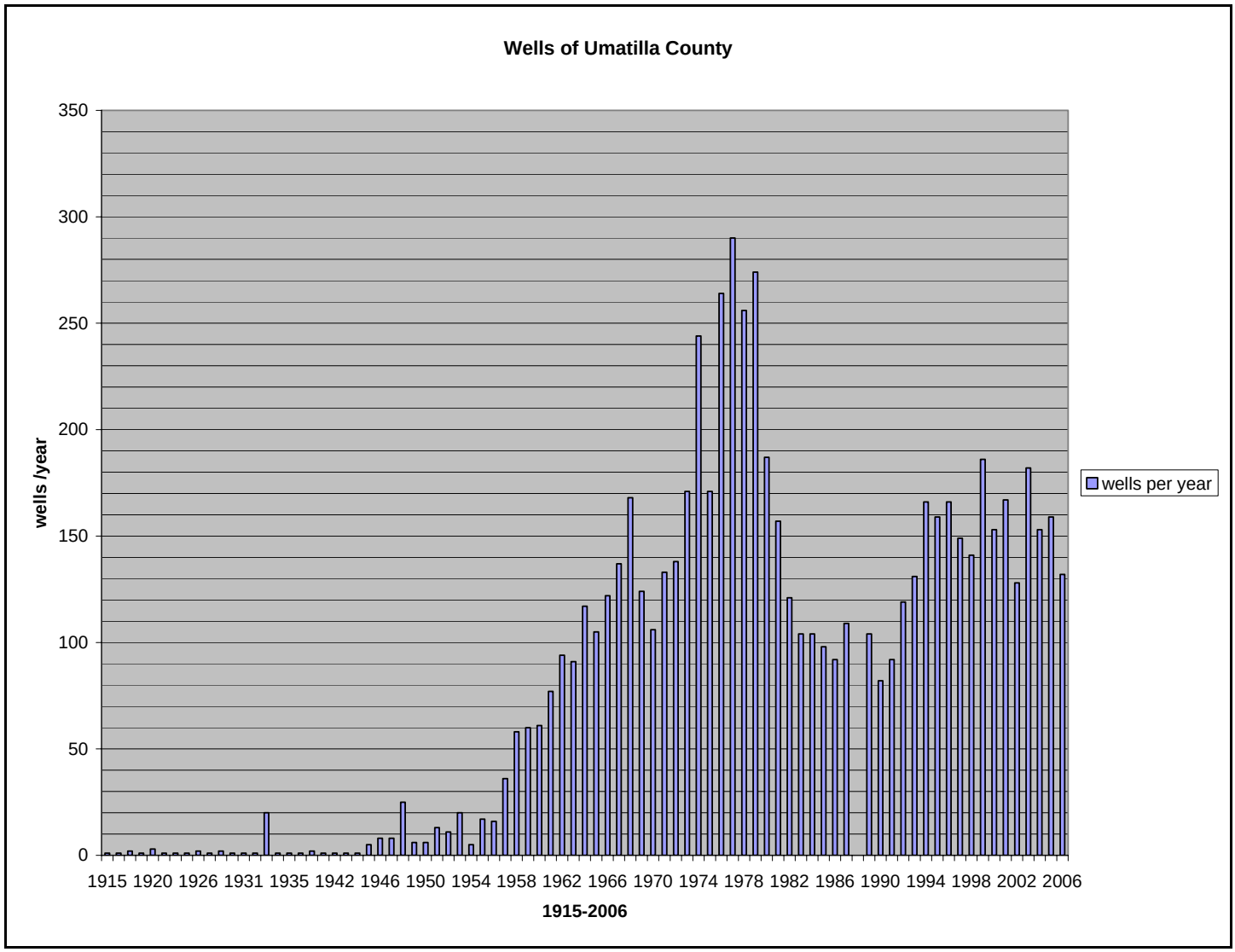


Figure 11: Umatilla County Wells by Year (Note: includes Walla Walla Basin and John Day Basin)

Groundwater Demand for Irrigation

In terms of annual pumpage, irrigation accounts for the largest volume of groundwater consumption each year. Figure 11 portrays the distribution of primary groundwater rights in the Sub-Basin (note, figure 14 includes all groundwater rights).

According to OWRD estimates, groundwater rights in the Sub-Basin total approximately 273,987 acre-feet of primary and approximately 55,689 acre-feet of supplemental groundwater demand annually. These are further broke out as follows:

- Primary Irrigation – 142,095 acre-feet
- Supplemental Irrigation – 55,689 acre-feet
- Primary Other Uses – 131,891 acre-feet

Exempt/Domestic Wells

According to OWRD there are approximately 3,909 exempt domestic wells with an annual groundwater demand estimated to be as low as 920 acre-feet per year to as high as 5806 acre-feet per year[19]. These estimates were based on a series of Task Force questions using the best data available to OWRD. The OWRD report and support documents can be found in Appendix N.

4-3 ASSESSING WATER RIGHT DEMAND VS. USE

Irrigation (Surface Water)

About 164,000 acres of land are listed on valid primary water rights in the Sub-Basin. Of these, about 121,000 acres (74%) use surface-water sources. About 80,000 acres are listed on valid supplemental rights, of which about 54,000 acres (68%) use surface-water sources. Since supplemental rights can only be filed over primary rights, a total of 121,000 acres listed on primary rights represents an estimate of the maximum number of irrigable acres that are listed on currently valid water rights.

OWRD was not able to compile an analysis of irrigation practices for this plan but estimate that water use is somewhere between 1.50 and 3.00 acre-feet/acre/year. Therefore the current water right demands of current surface water rights, lies somewhere between 184,500 and 364,200 acre-feet per year. OWRD states that although the maximum surface water demand is considered to be about 364,200 acre-feet per year, actual water use is probably somewhat less due to the conservation methods that have been implemented over the years and the fact that all lands are not irrigated in any given year.

Irrigation (Groundwater)

About 43,000 acres of land are listed on primary ground-water rights and about 25,000 acres are listed on supplemental ground-water rights within the Sub-Basin. These groundwater rights are for utilization of bedrock aquifers in the Columbia River Basalt

Group(confined basalt aquifers) and water table aquifers in alluvial sediments that overlie the basalts in some areas (alluvial aquifers). An estimate by OWRD using available data suggests that roughly 80-90% of these rights use a basalt aquifer source.

Using the same estimates as the surface water use estimates above (1.50 to 3.00 af annual water demand) this would account for annual water demands as follows (note: OWRD did not provide data addressing how many supplemental water rights are tied to primary groundwater rights so the totals are separated):

- Primary: 64,500 – 129,000
- Supplemental: 37,500 – 75,000

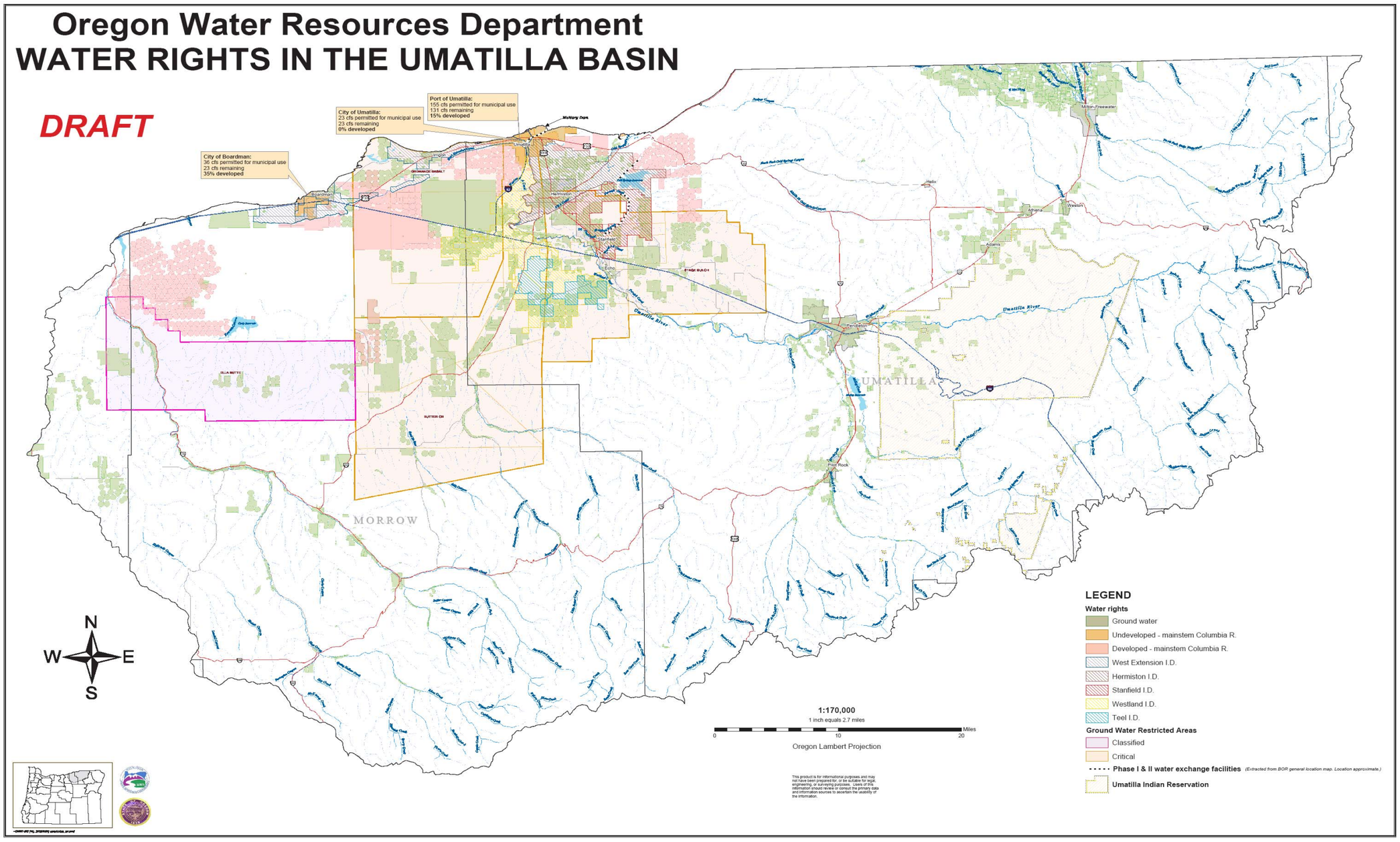


Figure 12: Umatilla Basin Water Rights and Administrative Areas (OWRD, Not to Scale)

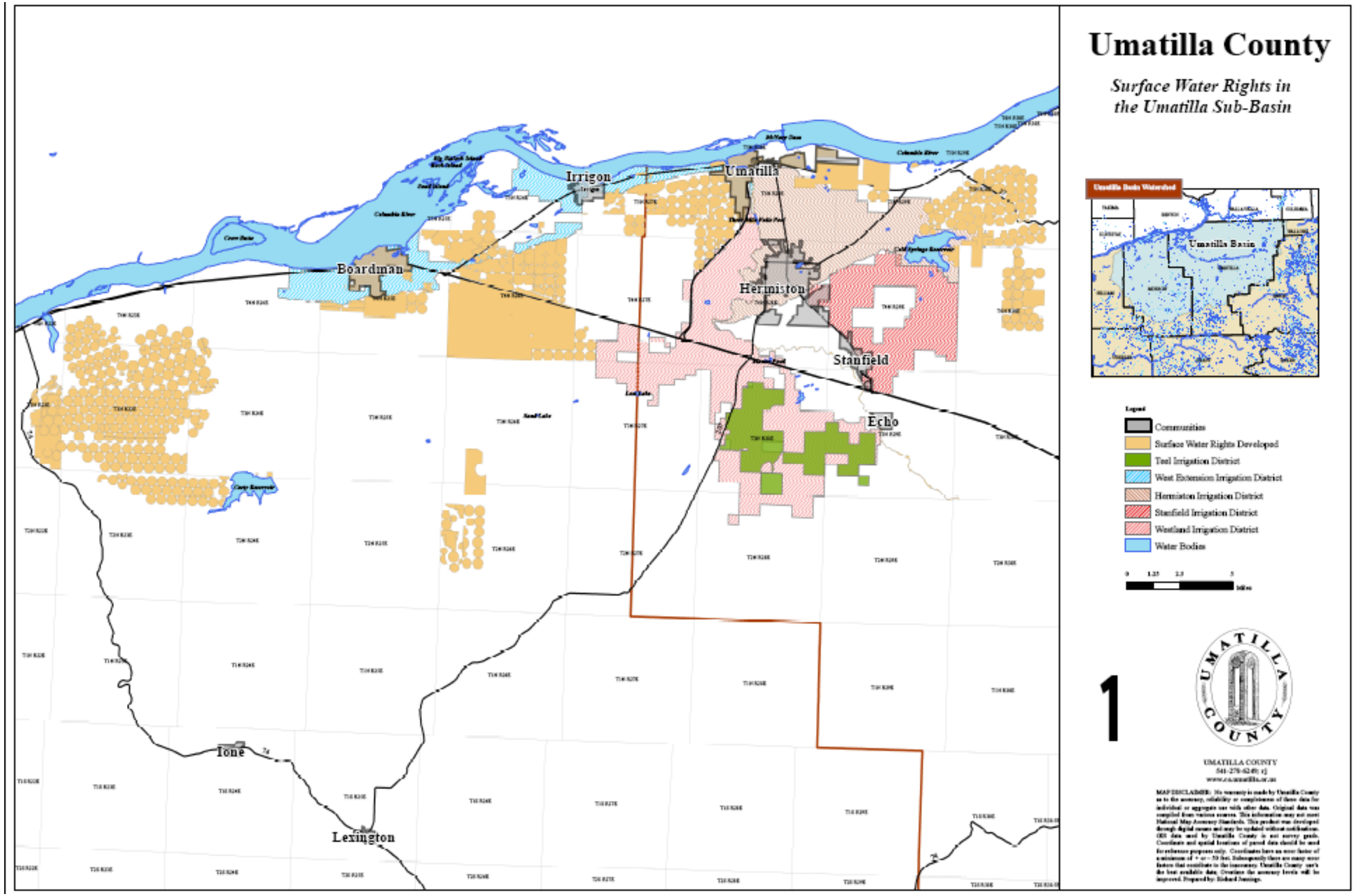


Figure 13: Surface Water Rights in the Lower Umatilla Basin (Draft - Not to Scale)

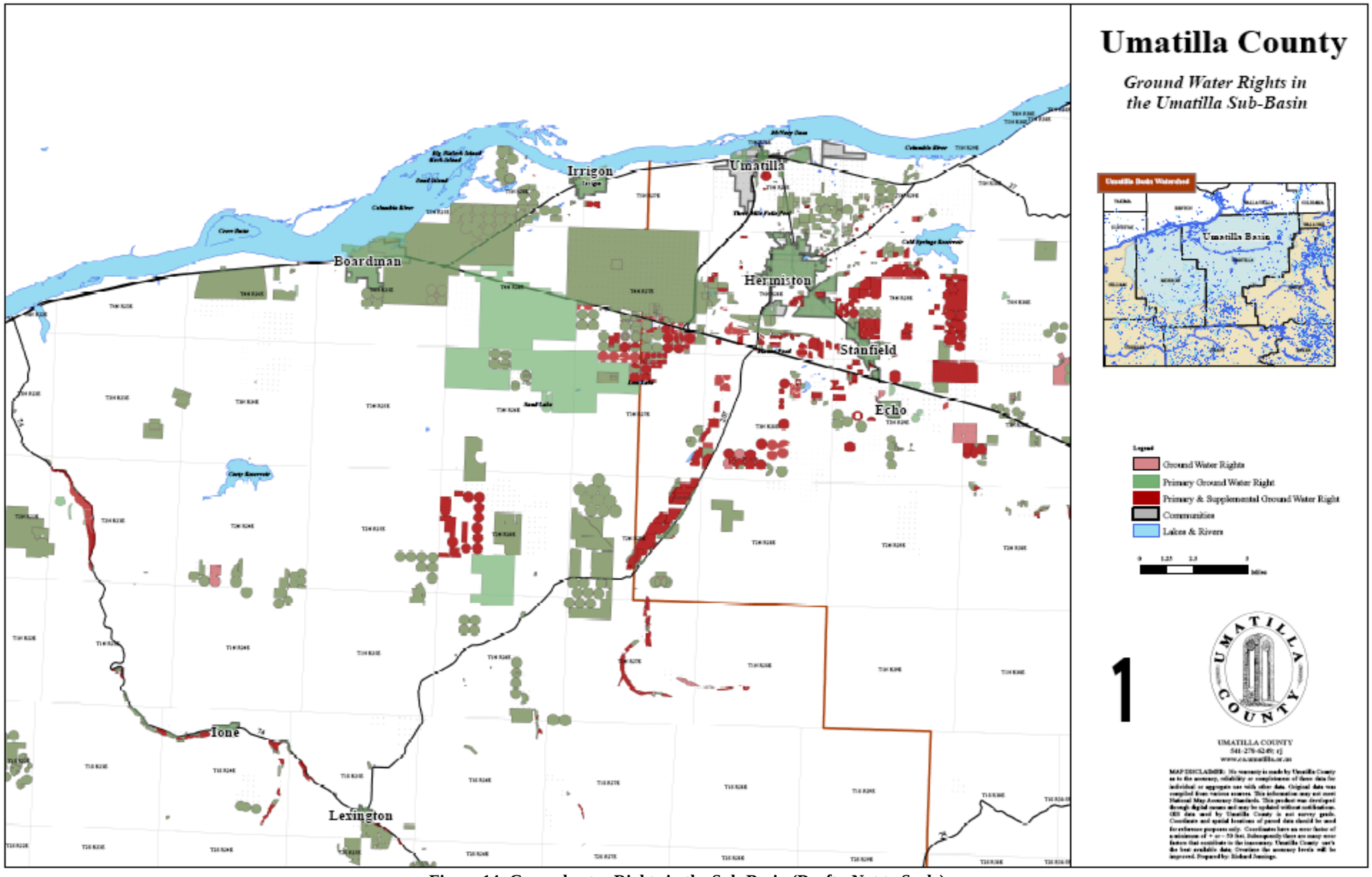


Figure 14: Groundwater Rights in the Sub-Basin (Draft - Not to Scale)

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4-4 FUTURE WATER NEEDS

Municipal Water Rights

Nine of the twelve incorporated cities in Umatilla County are located in the Sub-Basin. All nine cities rely upon basalt groundwater to meet their current needs and all cities have water right permits that exceed their existing demand to allow each city to accommodate future growth.

Currently, Sub-Basin municipal use of the basalt groundwater system is approximately 12,095 acre-feet annually. This is within the 10,000-64,000 ac-ft range that the USGS estimates to recharge naturally in the basalt system. Therefore, current municipal use appears to be sustainable.

Full build-out of the water permits from the nine municipalities within the Sub-Basin would be approximately 126,694 ac-ft which exceeds the rate of estimated natural recharge, potentially resulting in increased basalt groundwater system declines.

The intent of this plan is to assure that sufficient groundwater supplies, of sufficient quality are available to municipalities when growth results in the exercise of the full permit. This is to ensure economical water supplies for cities without the added capital expense of deeper basalt pumping and/or well deepening.

City of Pendleton Municipal ASR Project

Some municipalities (e.g. Helix, Adams, Athena, Pendleton and Pilot Rock) have very limited access to water sources other than the basalt groundwater aquifer. One municipality, the City of Pendleton, is currently addressing their future demands, and limited water supply options, with a state of the art Aquifer Storage and Recovery (ASR) facility.

The City of Pendleton has just completed its fifth season of recharge with 468 million gallons (MG - about 1,400 acre-ft) stored. The City is now in the process of recovering the stored water at this time and will have updated groundwater decline and usage information by November 2008.

Background: the City began ASR in 2004 and the historical numbers for storage and recovery each year are:
2004: 385 MG (about 1,150 acre-ft)
2005: 235 MG (about 700 acre-ft)
2006: 492 MG (about 1,475 acre-ft)
2007: 381 MG (about 1,140 acre-ft)
The City uses between 1,300 MG (about 3,900 acre-ft) to 1,500 MG (about 4,500 acre-ft) annually for its water supply.

Based on these four full seasons of ASR, the City has gone from reliance of 62% native groundwater and 38% springs source as the average prior to 2004 to 25% native groundwater and 75% surface water as the average during the first four years of ASR. The City also has seen a reduction in the groundwater level decline from an average of 3.4-feet per year prior to 2004 to an average of 2.0-feet per year during the first four years of ASR.

Water Supply during Long-Term Drought

A lack of sufficient surface water storage and sporadic weather and surface water runoff patterns make the Sub-Basin vulnerable to drought situations. During times of drought OWRD can make a drought declaration and implement drought rules to allow water users to utilize emergency water supplies to fulfill water rights not met due to the drought situation. Most of these "emergency" water supplies are from groundwater sources.

Amongst other things, the basalt groundwater aquifers can be viewed as nature's savings account, available for use when the usual water supplies are unavailable. Therefore, mechanisms must be in place to assure that adequate basalt groundwater supplies at depths that are economical to pump are protected to ensure that emergency water sources are available to meet irrigation, commercial, municipal, industrial and exempt demands during times of both long and short term drought. The term commonly used for this type of practice is "conjunctive management."

Production of New Agricultural Products

Renewable fuels and renewable fuel production is gaining popularity in the United States and in the Pacific Northwest. While renewable fuels will most likely be proposed as economic opportunities in rural Oregon and Umatilla County, adequate water supplies will be necessary to assure that Umatilla County has adequate water to maintain its irrigated food production, its bio-fuel feedstock production and the industrial water necessary for the production of the bio-fuels and the related co-products.

Bio-Diesel: The Oregon Department of Agriculture states that bio-diesel facilities east of The Dalles could produce between 20-40 million gallons per year of bio-diesel and that this would require 200,000 to 450,000 acres of canola production.[20] Locally grown bio-diesel feedstocks, would require water for both the feedstock production and the processing of bio-diesel.

Ethanol: Corn is the primary ethanol feedstock. Most of the proposed ethanol plants in the vicinity have proposed to source the feedstock out of the Midwest, shipping the feedstock via unit train to the Umatilla/Morrow County area and processing it into ethanol and Dried Distillers Grains with Solubles (DDGS). If this occurred, the primary water demand for ethanol production would be for the production process.

There are conflicting figures regarding the water needs to produce ethanol. The Renewable Fuels Association estimates that 3 gallons of water are required to process one gallon of ethanol.[21] Therefore, as an example, a typical 50 million gallon per year ethanol plant would require approximately 460 acre-feet of water annually to meet the

processing needs alone. This does not take into account the amount of water necessary to grow the feedstocks that are processed into ethanol.

Water Needs of the Umatilla Indian Reservation

The Task Force acknowledges that the CTUIR claim water rights in the Umatilla Sub-Basin. The claims include instream flows to support its Treaty-reserved fishery and consumptive use rights for its Reservation homeland, pursuant to the Winter's Doctrine. The CTUIR believe that their water rights claims under the Winter's Doctrine have not yet been adjudicated. The Task Force supports the settlement of the CTUIR's water rights in the Umatilla River Sub-Basin in order to relieve the uncertainty about the availability of Umatilla River water that may be used to meet future water needs in Umatilla County. The Task Force has also determined that the settlement of the water rights of the CTUIR under their Treaty and Federal law is beyond the scope of its authority.

Water-supply requirements on the Umatilla Indian Reservation are the same as for any other entity – irrigation, economic development and domestic uses. In addition, the CTUIR require water for instream flows in the Umatilla River to support the CTUIR's salmon, trout and lamprey fishery and Umatilla River ecology. The approximate amounts of water requested by Tribes in the long-term are:

Irrigation – 50,000 acre feet per year;
Domestic/Commercial/Municipal/Industrial (DCMI) – 13,500 acre feet per year; and
Fishery (in-stream flows in the Umatilla River) – 310,500 acre feet per year.

By the year 2050, the CTUIR expect to fully develop its irrigation needs, meet the instream flow needs, and utilize an estimated 4500-5500 acre feet of the DCMI needs. As the population and economy of the Reservation continues to grow in the long-term, the CTUIR anticipate eventually utilizing the full 13,500 acre feet of DCMI needs.

4-5 ON-GOING WATER NEED AND SUPPLY ASSESSMENTS

Oregon Water Supply and Conservation Initiative

The Oregon State Legislature passed the Oregon Water Supply and Conservation Initiative (OWSCI) during the 2007 session. The initiative provides $750,000 and has five main components:

1. A compilation of already existing information regarding water demands and needs in Oregon
2. A statewide inventory of already identified but undeveloped water conservation projects
3. A statewide inventory of potential water storage sites
4. Match funding for community based and regional water supply planning
5. Completing of a state investigation of basin yield estimates

This project will help the Sub-Basin stakeholders quantify potential needs that have not been included in the 2050 Plan due to lack of financial resources and technical staff. The

Task Force supported this effort in 2007 and will continue to coordinate with OWRD as the study concludes.

The OWSCI did not include a strong groundwater component even though groundwater is a heavily relied upon water resource for all water needs. As the OWSCI concludes, leading into the '09 Legislative Session, it is the hope of the Task Force that additional funds will be allocated to address groundwater supply and groundwater aquifer characterization.

Senate Bill 1069

During their 2008 Special Session, the Oregon State Legislature passed the Agriculture and Community Water Act (SB 1069) which included $750,000 for use in the Umatilla Basin. A study, lead by OWRD and contracted to a consortium of consultants, led by IRZ consulting, is currently underway with an emphasis on the following:

(a) Identify existing infrastructure that can be used and new infrastructure necessary to divert winter water for both alluvial groundwater recharge and basalt injection.
(b) Focus on surface recharge opportunities in the Ordnance and Echo Meadows alluvial aquifers and basalt ground water injection in the Ordnance, Butter Creek, and Stage Gulch Critical Groundwater Areas.
(c) Determine water quality limitations and options for ensuring protection and improvement of water quality.
(d) Identify permitting and other issues related to potential construction and implementation of alluvial recharge and basalt underground injection in the assessment areas.
(e) Identify opportunities to improve streamflows in the Lower Umatilla River.

The intent is to complete the initial phases of the study by the 2009 regular Oregon Legislative Session which, and again request funding to build off of the results. The Task Force has been a major partner and contributor to this effort and will continue to support efforts to carry out project implementation.

The Umatilla Basin Project and the New Umatilla Water Supply Study
A partnership between the CTUIR and the West Extension, Stanfield and Hermiston Irrigation Districts resulted in construction in the 1990's of Phases I and II of the Umatilla Basin Project. Developed to address century-old problems of an irrigation de-watered Umatilla River and subsequent salmon extinctions, the Project partially restored Umatilla River stream flows and allowed three stocks of salmon to be reintroduced and partially recovered. The Umatilla Basin Project, authorized by Congress in 1988, is heralded as the most successful salmon and stream flow restoration project in the Columbia River Basin.

"New" water for the Umatilla Basin irrigators is provided by the Umatilla Basin Project by tapping Columbia River stream flows. The Project is an ingenious design of a relatively simple set of new pumps that raise Columbia River water and deliver it to the pre-existing distribution systems of the irrigation districts. For every "bucket" of

Columbia River water that is pumped to the districts, the Districts do not divert a "bucket" of Umatilla River water which results cumulatively in partially restored Umatilla River stream flows.

Key to the success of the Umatilla Basin Project was the commitment by the CTUIR that a partnership with irrigators would provide water for instream flows and fish while protecting existing irrigation water rights. This success and the strong alliances that resulted among water users in the Basin, now form the foundation for a new round of water development toward the vision of Phase III of the Project. By providing new Columbia River water under a stakeholder's supported Phase III project for irrigation districts and others that have historically used Umatilla River water, the CTUIR can then use the Umatilla River for its water needs.

Section 5
WATER MANAGEMENT

5-1 GROUNDWATER MANAGEMENT ("RATIONALIZATION") SCENARIOS

Groundwater depletion, as measured by water level declines over time, has occurred in the CGAs and has been documented around Pendleton and other areas of the Sub-basin. The existing large water-level changes in the aquifers in the lower Sub-Basin were apparently a "surprise" and unplanned for by the state of Oregon and by the water rights holders. The Task Force is concerned that continued exploitation of basalt groundwater resources will lead to further declines throughout the Sub-basin and jeopardize the economic viability and livability of the county. To begin addressing the vulnerability of the aquifers to depletion and the long-term consequences of water-level declines on the local economy, the environment, and the landowners in the Sub-basin, the Task Force identified four potential groundwater development scenarios, which could guide future management of groundwater resources: (1) Unplanned Mining, (2) Orderly Depletion, (3) General Stabilization, and (4) Gradual Recovery.

Unplanned Mining. Unplanned mining occurs where there is intensive pumping of groundwater in areas that exceeds contemporary recharge, or where there is limited hydrologic connection between the deep aquifers being pumped and the area where recharge occurs. The identification of unplanned mining is typically identified by rapid regional declines in water levels in the pumped aquifer, declines in pumping rates from wells, or changes in the water quality usually recognizable as water with low mineral content changing to water with high mineral content. In the Sub-Basin, the unplanned mining in parts of the deep basalt aquifer was recognized in the western part of the county by water level declines amounting to 200 to 500 feet in about 50 years.

Orderly Depletion. Orderly depletion of the deep basalt aquifer reserves requires knowledge on the contemporary recharge rates and the quantity of water that is stored and recoverable from the deep basalt aquifer. Both the recharge rates and the recoverable reserves are poorly known at this time and will require more intensive data collection and interpretation. These studies are under consideration by many local, state and federal agencies, but the challenge is large because the hydrogeology of the basalt aquifers is known only at a reconnaissance level.

General Stabilization. Reducing pumping rates from existing wells and limiting new wells in the CGAs in the Sub-Basin is being used by the OWRD as a means to slow down the change in water levels in attempts to have the water levels "stabilize" over the long term. The expectation is that reducing pumping rates and limiting new wells will establish a "reasonably stable water level" in the CGAs.

Gradual Recovery. Part of a general stabilization expectation is that reduced pumping rates and limited access to the deep basalt aquifer, coupled with induced recharge from overlying aquifers and surface water resources, may lead to a gradual decrease in the rate of change in the water levels in the deep basalt aquifer, or may reverse the general trend of declining water levels altogether. Assessing whether the water levels have stabilized or are recovering is difficult to determine over the short-term as the declining water levels in the deep basalt aquifer occurred over a period of over 50 years. Gradual recovery can only be assessed over a longer time period. However, predictions of the time associated with gradual recovery can be made after conceptual models of the deep basalt aquifer system have been developed and tested using mathematical models of the groundwater systems using the updated hydrogeologic studies required by local, state, and federal agencies.

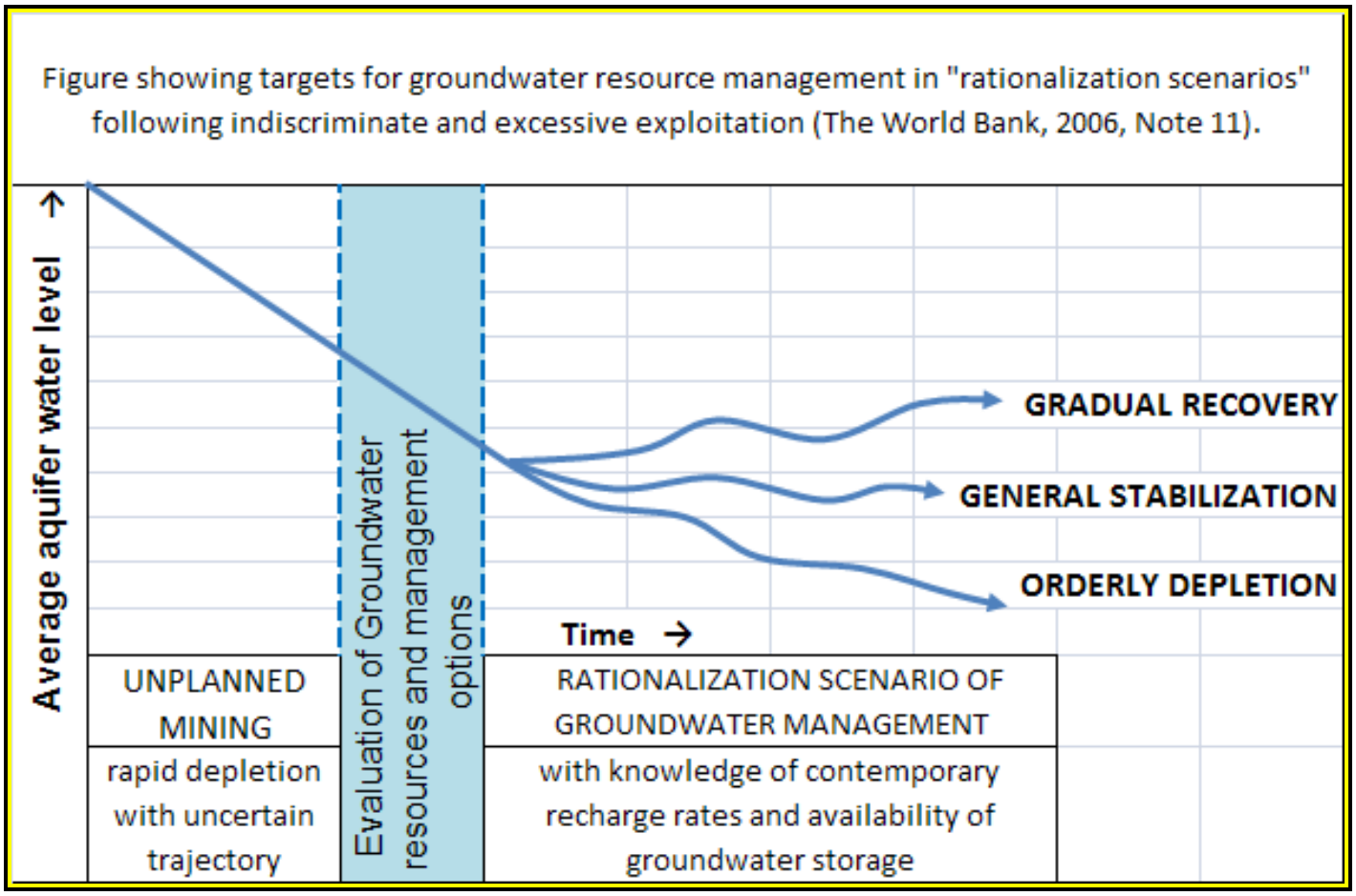


Figure15: Groundwater Rationalization Scenarios (OSU/IWW)

5-2 APPROVED MANAGEMENT SCENARIO (Gradual Recovery)

The Task Force believes there is sufficient annual recharge to the basalt aquifers to provide water for small consumptive uses such as domestic, community, and limited municipal development. However, more groundwater studies are needed to quantify the annual recharge to the basalt aquifer so development can occur without depleting the aquifers and injuring existing users. Continued development of the basalt aquifers throughout the Sub-Basin, at the levels that were permitted prior to the designation of CGAs, is not sustainable, and is, therefore, inconsistent with the Task Forces' objective to "…protect and enhance groundwater quantity, as an essential natural resource." Moreover, the Task Force believes the only management scenario that can meet the sustainability goal, protect and enhance groundwater quantity, and assure adequate groundwater for broad community needs through the year 2050 is the Gradual Recovery Scenario.

The purposes of promoting the Gradual Recovery Scenario are (1) to restore groundwater to sustainable levels that support domestic, community, and municipal development, (2) to prevent the decline of the basalt aquifers throughout the Sub-Basin, and (3) to build up the basalt aquifer system levels to enable the basin to withstand a long-term drought period when most water needs would be supplied by groundwater pumpage. It is important to note that if gradual recovery were to be achieved, it could also assure that environmental needs associated with surface water are not compromised during times of drought due to the fact that consumptive uses would have enough stored groundwater to use as an alternative.

Management Practices in Use

There are a variety of management tools currently being utilized in the Sub-Basin to optimize the use of existing water resources available to water users. Most cities in the Sub-Basin have developed Water Management and Conservation Plans that have been approved by WRC and measures implemented by the irrigation community have made them some of the most efficient water users in the State of Oregon, if not the United States. The following is a partial list of existing management tools being utilized in the basin (Appendix R provides a more thorough history of water use efficiencies):

- Soil water monitoring
- Low pressure drop heads for center pivot sprinklers.
- Drip irrigation and plastic ground cover in row crops.
- Fertilization to OSU soil test recommendations for water quality improvements
- Winter storage of flood flows for later consumptive use
- Controlled recharge with current irrigation systems in times of high flows at controlled water quality improvement sites
- Large scale basalt and alluvial recharge projects
- Groundwater Rotation Agreements (Butter Creek CGA)

Management Tools Considered

In addition to the management tools listed above, the Task Force has reviewed other management tools being utilized to mitigate existing water problems associated with quantity and/or quality. The following is a partial list of the management tools reviewed by the Task Force over the five year planning effort:

Water Banking and Mitigation Credit programs
Conservation/efficiency systems and financial incentives
Effluent utilization
Reservoir and Federal infrastructure optimization
Financial incentives for rotation agreements
County and state funding reserves for water management

Most of these tools have provided options in other basins for existing water users to optimize water supplies available to them. Section six of this 2050 Plan includes many of these options and expands upon this list to develop a means of pursuing gradual recovery of basalt groundwater aquifers. Many of the recommendations focus upon expanding the use of existing management tools and incorporating some of the other management tools that have been researched but not implemented in the Sub-Basin.

Section 6
UMATILLA SUB-BASIN MANAGEMENT ALTERNATIVES, PROJECTS AND GOALS TO ACHIEVE GRADUAL RECOVERY

SUMMARY

The Task Force recommends a concept to gradually recover the confined basalt aquifer as a means of protecting municipal and domestic water supplies, as well as to provide a means to ensure that water is available as an emergency (supplemental) water supply for all uses during future drought periods.

The Task Force recognizes that there is no single, simple solution or "quick fix," which can be implemented to provide water supplies to meet current and future water needs in the Sub-Basin. Everything from supply and demand to policy and funding must be coordinated to develop a holistic approach to meet long-term water supply needs and assure that existing water rights holders and water users are not impacted by the process. Basically, the process can be broken down into a series of benchmarks that will most likely take 50+ years to meet but will provide water security for the Sub-Basin well into the future.

This chapter is intended to provide a general overview of the scale and size of the projects, policy needs and funding necessary to assure long-term water supplies for the Sub-Basin. There are several work products to be completed to develop the knowledge and policy necessary to meet the gradual recovery goal. This section breaks out separately identified management alternatives to deal with (1) meeting current water demands (both consumptive demands and environmental demands); (2) preventing further over-appropriation and assessing surface and groundwater availability; and (3) a general, long-term water management outlook through the year 2050 and beyond. As stated above, any one of the management alternatives included in this chapter will not meet the gradual recovery goal. The management alternatives provide options for Umatilla County, the State of Oregon, CTUIR, and other water stakeholders to pursue jointly or separately to meet a management need. The intent is that if these concepts are implemented in a coordinated manner, over time the gradual recovery goal could be achieved.

Continuing Support for Small Scale Demonstration Projects

Many small, beneficial water management projects have been identified during the development of this plan. While important to gaining scientific knowledge and furthering Sub-Basin wide water restoration efforts, these projects are not addressed in this chapter. The general concept remains and it is hereby found that projects of any size that are multi-beneficial in nature, developed to enhance the knowledge of ground and surface supplies and interaction, and that deal with site specific ground and surface water

restoration meet the intent of this plan and should be supported by all stakeholders and agencies that endorse this plan.

Plan Goals and Directions

The Task Force adopted and utilized nine primary goals to address the problems in the Sub-Basin and pursue in the development of the management alternatives. Each management alternative in this chapter has been developed to meet one or more of the nine plan goals. If looked at holistically, all nine plan goals would be met if each of the proposed management alternatives were implemented, over-time as a Sub-Basin management package. The nine plan goals are as follows:

1. (Sustainability) The purpose of the plan is to assure that water resources are managed in a sustainable manner to meet current and future uses in the Umatilla Sub-Basin. Water quantity and quality will be managed to support and improve economic, environmental, public health, and quality of life conditions in the county.

2. (Public Outreach) Plan development will require public outreach and education and the solicitation of input and ideas from the public. Approval and successful implementation of the plan will require broad public support. The Task Force will seek input from members of the public and incorporate such input, when appropriate, in the plan.

3. (Local Control) Water resources management and permitting is a function of state government, while land-use planning and zoning is a function of the county and city governments. Over-development of groundwater resources in the lower Sub-Basin has restricted further groundwater development in the critical groundwater areas, thereby limiting land uses in those areas. The plan will provide an analysis and recommendations on (A) resolving inconsistencies in state laws/rules that impede integration of water management/permitting and land use regulation and (B) establishing more local control over water management/regulation in Umatilla County, so that the community has more certainty in the availability of water supplies required to meet current and future needs.

4. (Surface Water and Groundwater Connection) There are variable degrees of connection between groundwater and stream flows throughout the Sub-Basin. Water development and use in any part of the basin has the potential to affect water supplies and users in other parts of the basin. The plan will recognize this interconnectedness and consider all water sources in the entire basin to ensure sustainability of groundwater and surface water to meet the current and projected water supply needs.

5. (Water Budget) Sustainable management will require an improved understanding of the annual water budget in the Sub-Basin. Using the best available information, the plan will assess how much water is in the basin, describe its seasonal and spatial distribution, describe its quality and affects of quality on its use, and identify how

much is usable on a sustained basis. The plan will identify gaps in the hydrological data/information and the means and methods for acquiring the information.

6. (Current and Future Needs) It is projected that water needs in the Sub-Basin for most beneficial uses will increase through 2050. The plan will describe current uses of water and project future water needs in the basin, including federal reserved water rights. The plan will estimate the quantities needed for the various beneficial uses. The plan will describe the means and methods for protecting and enhancing water supplies so they are available to meet projected needs.

7. (Projects & Funding) To assure water availability to meet the community's needs, the plan will assess and recommend methods and projects that will improve water supplies and water quality. Recommended projects and actions may include water conservation, aquifer recharge, new surface storage facilities, changes in zoning through the appropriate legislative process, using Columbia River water, water rights transfers and acquisition, changes in laws and regulations, and others. The plan will provide recommendations on funding mechanisms needed for implementing actions and projects and for supporting on-going water resources management programs, including monitoring of water supplies and use, conducting hydrologic studies, and managing land and water use.

8. (Flexibility) The understanding of the Sub-Basin's hydrology, the publics' priorities, and water needs will change over time. During the life of the plan, technology and water management tools will change and become available to water managers and users. The plan will be structured for flexibility to accommodate these changes. Periodic review of the plan will need to be an integral part of the 2050 Water Plan to ensure its utility in addressing the water needs and concerns of the citizens of Umatilla sub Basin as we proceed through the 21st century.

9. (Consensus) The political issues of Sub-Basin water management are not fully understood. The 2050 plan will identify political constraints and opportunities, and propose methods for reaching consensus, such as dispute resolution.

Public Involvement

The Task Force continues to stress public involvement in long-range water planning. In January 2008, Umatilla County and the Umatilla County Critical Groundwater Task Force retained the team of Cogan Owens Cogan, LLC and Bill Blosser (COC) to conduct an independent, third-party review of a January 17, 2008 draft of the Umatilla Sub-Basin 2050 Water Management Plan. The intent was to have an unbiased and formal review of the report to help the Task Force and Umatilla County understand the support, concerns and constraints associated with the 2050 Plan. The primary objectives of this review were to:

- Provide information about County residents' willingness to implement, fund and comply with proposed management alternatives; and

- Provide an unbiased review of proposed management alternatives and report on the feasibility to implement them.

The review was based on an extensive three-month outreach effort organized around three primary tasks:

- Preparation and distribution of informational materials about the Plan and public input opportunities that included a case statement, presentation talking points, press releases, and postings to the County's web site.
- Outreach to local stakeholders through a mailing to County households, questionnaire, workshops, work sessions, and interviews.
- Outreach to regional and statewide agencies and interest groups consisting of dissemination of requests for review, work sessions, interviews, and follow-up contacts.

In March 2008, a postcard was mailed to more than 11,000 random households in Umatilla County. The postcard informed County residents of how they could access the 2050 Plan questionnaire online or obtain a paper copy. The questionnaire asked for information on water use, the work of the Task Force, and key management alternatives described in the 2050 Plan. As of April 23, 116 completed questionnaires were returned.

In April 2008, more than 50 people attended three workshops in Hermiston, Milton-Freewater and Pendleton-Mission. After presentations on groundwater issues in the Umatilla Sub-Basin and the work of the Task Force, meeting participants were asked to comment on six key management alternatives and other aspects of the Plan.

Throughout April and May, 2008, the consultant team conducted interviews, either in person or by telephone, with both local and statewide groups. Interviews were conducted with fifteen (15) local jurisdictions, ten (10) interest groups, nine (9) state agencies, eight (8) irrigation districts, five (5) environmental groups, four (4) elected officials, two (2) watershed councils, and various other agencies.

The review results have been integrated into the plan and the entire review document can be found in Appendix R. Review results are provided for most of the management approaches described below. The results are general and are not intended to strengthen any of the proposals or recommendations that have been addressed in this plan. The purpose of including the review results was to provide Umatilla County with the general perception of the management alternatives, as well as to help Umatilla County understand the areas of the plan that need additional detail or that require additional coordination with other agencies and the general public prior to being pursued.

The Task Force has also received formal written comments throughout the planning process. Some of these formal comments are included as part of the review report completed by COC and incorporated into this plan as Appendix S. Additional comments received after the review report can be found in Appendix T. These comments detail specific areas of the plan that require additional detail (e.g. the scope of authority for a

water management entity), as well all or parts of management alternatives that are not supported. The Task Force appreciates the formal comments and recommends that they be addressed further by the county as it proceeds with discussions on the potential to implement the recommended management alternatives. Since the Water Plan has been developed to serve as a "living document" a placeholder for supplements and addendums has been included. This placeholder has been provided to allow Umatilla County to address comments and provide further detail as it moves forward with implementation.

Coordination

The interconnected nature of the water resources in the basin, the broad range of entities that are involved in water management and the number of people that will benefit from plan implementation make it difficult to achieve success without some formal means of coordination. A formal implementation process must be agreed upon to assure that the management alternatives proposed are being pursued in a coordinated manner and meeting the goal of gradual recovery. The following entities must be involved in order for the Board of Commissioners to move forward with plan implementation under the goal of gradual recovery.

Entities	Involvement
Local Government	
Umatilla County and Morrow County*	Lead in developing a management entity Ability to establish special districts and funding mechanisms Ability to develop coordinated lobbying efforts to leverage state funding and state agency assistance Coordination should involve formally addressing the possibility of developing a joint water use committee or special district to implement long-term water supply solutions and promote gradual recovery of the basalt groundwater system
Umatilla County and Morrow County municipalities	Allocate property taxes and other funding streams to meet public service obligations to their respective incorporated area Oversee their respective water rights, water supply infrastructure and long-term public facilities plans. Coordination should include assuring a fair funding scenario that does not place undue burden on municipalities. Plan

* Recommend the Board of Commissioners encourage Morrow County to participate in further planning efforts

	implementation should also assure that municipal water quality and quantity is improved, not impacted.
Tribal Government	
Confederated Tribes of the Umatilla Indian Reservation	Coordination should be formal through an MOA to address the interjurisdictional implementation of surface and groundwater management projects, mitigation, and water allocation. In addition to lands under Umatilla County jurisdiction, the county is also accountable to non-tribal, deeded property owners within the reservation boundaries. Coordination with the CTUIR should take this obligation into account Tribes will also be consulted under any water right permit process that must address OAR 690 Div 33. Therefore, strong coordination leading up to any water requests is necessary. CTUIR can assist in and be a part of a comprehensive outreach strategy regarding water quality and quantity. To be comprehensive and cover the Umatilla Sub-Basin the outreach strategy must include Tribal members and non-Tribal members residing on or owning land within the Umatilla Indian Reservation
State Government	
Governor's Office	Developing long-term statewide water policy (H2O Proposal) that could benefit/impact the Umatilla Sub-Basin Provides direction to state agencies Coordination should include working with the Governor's Office to assure that the Umatilla Basin is considered a top priority for funding and staff resources The Governor's Office also houses the Economic Revitalization Team which could be utilized to coordinate all of the state agencies throughout plan implementation
Oregon Water Resources Department	The regulatory body for all waters of the state Will regulate all transfers, new water rights and points of diversion resulting from plan implementation Regulates groundwater based on the Umatilla Basin Rules Managing the contract for the Umatilla Basin component of SB

	1069 Completing the Oregon Water Supply and Conservation Initiative which will include conservation recommendations and water demand projections to 2025 and 2050 Coordination should center on development of a Rules Advisory Committee to update the Umatilla Basin Rules and OWRD staff assistance in addressing opportunities to develop rules to govern how replacement water is allocated
Oregon Department of Environmental Quality	DEQ will have regulatory authority over water quality for any AR and ASR projects developed in the Umatilla Sub-Basin A member of the "Interagency Review Team" for water rights issued under OAR 690-033 Oversees monitoring for the Lower Umatilla Basin Groundwater Management Area Action Plan. Coordination should involve addressing projects that can have a net benefit to both groundwater quantity and quality in the LUBGWMA Oversees "Total Maximum Daily Load" (TMDL) requirements related to surface water quality. Coordination should involve addressing projects that can benefit both water quantity and possible net benefits to surface water quality (e.g. stream temperature)
Oregon Department of Fish and Wildlife	ODFW provides comments to OWRD. These comments are related to the consistency between new water use requests and the Fish and Wildlife Habitat Mitigation Goals and Standards (OAR 635-415), if new water rights propose to use surface water A member of the "Interagency Review Team" for water rights issued under OAR 690-033 Coordination should involve addressing potential benefits and impacts of project development on fish and wildlife species, addressing mitigation measures that should be undertaken as well who is responsible
Oregon Department of Agriculture	Implements the Umatilla Agricultural Water Quality Management

	Area Plan. Coordination should address opportunities to meet program targets of the Water Quality Management Plan Provides administrative oversight and financial support to the Umatilla County Soil and Water Conservation District. A member of the "Interagency Review Team" for water rights issued under OAR 690-033
Oregon Department of Health and Human Services	Regulates community water systems for compliance with quality standards
Federal Government	
United States Bureau of Reclamation	Oversees the Umatilla Basin Project as authorized by Congress Coordinates with Basin Project irrigation districts and stakeholders (e.g. CTUIR and fishery interests) in annual RiverOps meetings and decisions. These meetings are designed to optimize the Umatilla Basin Project authorization and infrastructure for the benefit of both irrigators and environmental needs A member of the CTUIR Tribal Water Rights Assessment Team under the Department of Interior Currently completing the Umatilla Basin Water Supply Study which includes Phase III of the Umatilla Basin Exchange. This study will provide options that could be pursued to meet CTUIR water rights. These options should assure that existing water rights are kept whole. Coordination should involve lobbying the CTUIR, Bureau of Reclamation and congressional members for the authorization and funding of a full Phase III exchange. Additionally, Umatilla County should push for the optimization of Umatilla Basin Project infrastructure to deliver water to the basin to be used for deficit reduction and replacement of basalt groundwater irrigation rights.
United States Fish and Wildlife Service	Provides consultation to OWRD for water right requests that fall under OAR 690-033 ("Division 33 Rules")

NOAA Fisheries	Umatilla County would not work directly with these agencies but would work through OWRD during consultation on any water right requests that may involve a Division 33 Rule review, mitigation and restoration.
Special Districts, Natural Resource Councils and Special Interest Groups	
Existing Irrigation Districts and Improvement Districts	Oversee an extensive network of water rights, water storage and water delivery infrastructure out of the Columbia River and Umatilla River Coordination should involve the development of a Board of Control to work with Umatilla County or an established governing entity to prioritize water delivery and efficiency projects in the Sub-Basin
Umatilla County Soil and Water Conservation District (SWCD)*	Implementing body for the LUBGWMA Action Plan Conduit to Federal funds for efficiency projects related to water quantity Conduit to Federal funds for water quality and water supply improvement projects A major outreach entity to rural property owners in Umatilla County Coordination should involve a comprehensive outreach strategy focusing on both water quality and quantity. Additionally the SWCD could become a partner in the implementation and monitoring of mitigation, restoration and efficiency projects that could be required if new water supplies are developed to meet current and future water demands
Umatilla Basin Watershed Council and Walla Walla Basin Watershed Council†	A strong outreach entity for both rural and urban residents of the Umatilla River Watershed. Should be a part of a comprehensive outreach strategy in the basin If provided additional funds the Watershed Council could complete projects such as aquifer recharge, and wetland enhancement to increase return flows to the Umatilla Sub-Basin. These projects may be a condition of permits issued to implement deficit reduction/groundwater replacement. The Watershed Council could also oversee monitoring and reporting on small and

* Task Force recommends that Umatilla County encourage the Morrow County Soil and Water Conservation District to participate in further planning activities

† Recommend that the Board of Commissioners continue to coordinate with the Walla Walla Basin Watershed Council on outreach, project development, studies and monitoring.

	large projects.
OSU Agriculture Extension Service	Good outreach entity with a focus on the agricultural community, rural counties and young children via FFA and 4H. Should be included in the comprehensive outreach strategy for water quality and quantity
Port of Umatilla and Port of Morrow*	Have multi-purpose water rights from various sources that could be developed to meet non-irrigation consumptive use needs. Conduit for funding and cost share
Umatilla Electric Cooperative	Involved in state and federal lobbying efforts to increase water supply opportunities for their members. Coordination should involve developing consensus with UEC in a unified effort to promote State of Oregon investment in water supply projects to meet Umatilla Sub-Basin demands.

In addition to the table above it is recommended that the county utilize staff and/or contracts to coordinate with statewide interest groups and lobbyists that focus on water supply protection and the environment. A great example of how this coordination can lead to successful action at the State level is the coordinated development and a consensus amongst water interest groups that resulted in the passage of SB 1069 during the 2008 Special Session of the Oregon State Legislature.

Top Priorities for 2008 through 2011

The four CGA's have been the top priority since the development of the Umatilla County Periodic Review Work Plan and the formation of the Task Force. When establishing the mission of the Task Force, the Umatilla County Board of Commissioners explicably stated …"especially in designated Critical Groundwater Areas." The Task Force has addressed this priority in the plan by recommending projects and management alternatives that utilize the four CGA's as the cornerstone for plan implementation. When developing a means for implementation, the Task Force recommends that the CGA's be given top priority.

Utilize the 2009 Oregon legislative session to expand upon the progress made by SB 1069, reserve Columbia River supplies to enable deficit reduction and groundwater replacement to proceed and promote leverage from the State of Oregon to begin moving forward with Phase III and a final settlement of CTUIR water claims. Work through the 2009 session should also include a request for the state to direct staff and funding resources for a Division 33 Interagency Review Team to assist in assuring that any water development benefit improves stream flow and water quality in the Umatilla River during the low-flow period and maintains flow volumes and velocities and water quality to meet fish needs in the Columbia River.

* The Task Force recognizes that involvement by the Port of Morrow may or may not be based on Morrow County involvement

It is also recommended that the county begin negotiations on a Memorandum of Agreement, with the goal of promoting gradual recovery of the basalt aquifer system, to establish a formal decision making body and base funding to carry out the results of SB 1069. The MOA should also include a request to establish a Umatilla Basin Rules Advisory Committee with the purpose of setting up and administering a replacement water/Deficit Reduction Program in the lower Umatilla Sub-Basin and specific Basin Rule updates to limit additional groundwater development until a vetted groundwater budget is completed.

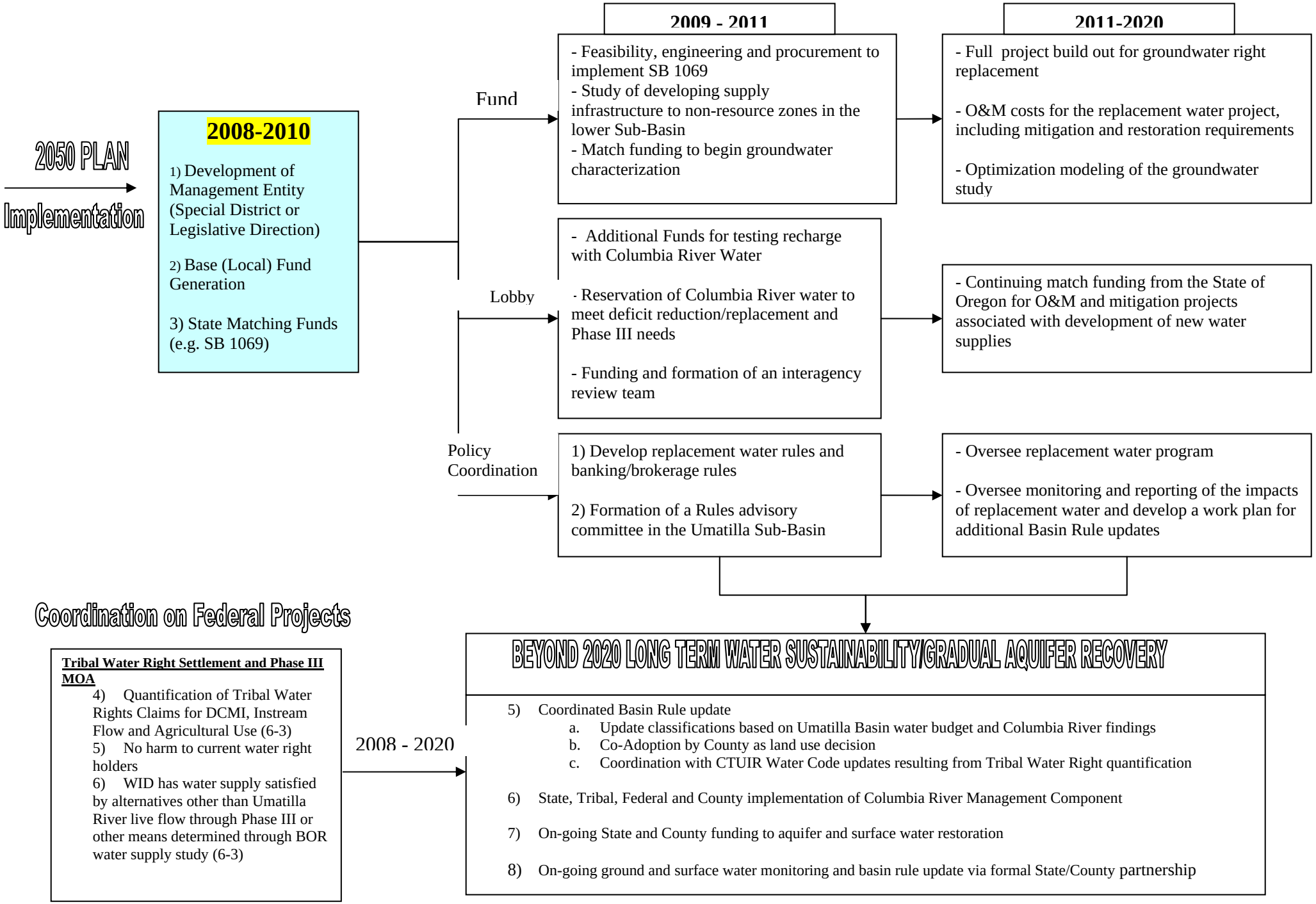
Conceptual Timeline for Plan Implementation

Umatilla County Action Item	Years 2008 – 2013	Years 2014 – 2019	2020 - 2050
Plan Implementation			
Establishment of a local management entity	**2008 -** Task Force transition team, govt. to govt. coordination and negotiation. **2009 –** MOA amongst local governments, including a legislative agenda for the 09 Oregon Legislative Session (recommend building off of SB 1069). Development and funding of a lobby team to push basin agenda in Salem. **2010-** MOA transitions into the formation of a management entity including by-laws and management or special district boundaries. Note: This management alternative must be completed by the 2011 Oregon Legislative Session to continue progress on SB 1069 and manage new supply		
Funding			
Development of Base (local) funding mechanism	**2008/2009** – Task Force transition team and Umatilla County assess the different funding scenarios and analyze which option should be pursued in the next five years (e.g will geographic scope be countywide, regional sub-district, or based on watershed boundaries. Begin outreach and assessment of public support via county-wide and regional outreach **2009 through 2013–** implementation of base funding	**2014 through 2019 –** sunset base funding scenario or include additional lands as studies and project development expands beyond the lower Umatilla Sub-Basin	

	scenario to develop projects identified as feasible under SB 1069 or state, federal (e.g. Bureau of Reclamation) and local assessments		
State Funding	**2008/2009 –** Continue lobbying for support of state investment in water planning, efficiency and development projects. Coordinate with OWRD and the Governor's office on their respective requests		
Long-Term Funding	**2011 through 2013 –** Negotiate a funding system that integrates or sunsets base funding with the formation of fees assessed based on project development, operation and maintenance	**2014 through 2050 –** Updates to the funding scenario as new projects come on-line or as requested by the local water management entity	
Meeting Current Water Demands			
Umatilla County Action Item	**Years 2008 – 2013**	**Years 2014 – 2019**	**2020 - 2050**
Critical Groundwater Areas and Lower Umatilla Basin	**2008 –** Continue coordinating with OWRD and the SB 1069 working group to assess the feasibility of providing Columbia River water to replace groundwater rights in the four CGAs. Develop the administrative portion of the feasibility to be included with the engineering and development costs **2009 –** Lobby for a water right reservation out of the Columbia River, state funding to continue feasibility efforts initiated by SB 1069 and funding and legislative direction to form an interagency review team to address potential water quality, fish and wildlife impacts and mitigation requirements **2010 through 2013 –** Fund and develop all or a portion of	Full build-out of projects for groundwater right replacement in CGAs, and ability to utilize water within an established project boundary	Potential for development of infrastructure and transfer of water to the upper Umatilla Sub-Basin if necessary

	the infrastructure to complete deficit reduction/groundwater replacement. Begin Deficit Reduction/Groundwater Replacement		
CTUIR Tribal Water Rights Assessment and Phase III	**2008/2009 –** Completion of the Bureau of Reclamation Umatilla Basin Water Supply Study. **2008through 2013 –** Continue lobbying for Phase III funding and development as well as for the State of Oregon to reserve an amount of water out of the Columbia River to meeting the demands of Westland Irrigation District and contract users	Potential settlement of the CTUIR Tribal Water Right Continue lobbying to address the opportunity to optimize Phase I, II and III infrastructure to meet the needs of the irrigation districts, CTUIR needs environmental needs and groundwater replacement	Coordinated Water Management between State of Oregon and CTUIR
Non-Exempt Residential, Commercial, and Industrial Needs	**2008 through 2013 –** Work with the Port of Umatilla, City of Hermiston and City of Umatilla to identify potential opportunities to develop the City of Umatilla or Port of Umatilla/City of Hermiston Columbia River water right to service the development of non-resource zones in the lower Sub-Basin		
Exempt Needs	**2009** - Formalize the Umatilla County exempt well resolution through an update to the Goal 5 chapter of the Umatilla County Comprehensive Plan		
Water Policy and Regulatory Updates	**2009/2010 –** Request that the WRC appoint a Rules Advisory Committee to update the Umatilla Basin Rules under the goal of Gradual Recovery **2010/2011 –** Work with basin stakeholders and water providers to develop rules to govern the deficit reduction/replacement water program. These rules need to be complete by 2011 to obtain legislative approval (note: legislation only necessary if changes in ORS language is required)	**2014 through 2019** – Potential for updates to Umatilla Basin Rules and water availability analysis following CTUIR Tribal Water Right settlement	**2021 –** Estimated date for completion of Groundwater characterization studies and necessary optimization modeling. This would trigger final rule amendments

	2011 and 2013 Legislative Sessions: Continue to lobby the State of Oregon to invest in the development of a Columbia River Management Plan		including classification of water identified as available
Water Budget Development (Quantifying Water Availability)			
Synoptic Sampling of Water Quality and Quantity	**2009-2019 –** Utilize the existing synoptic sampling network from both DEQ and OWRD to track the results of plan implementation on groundwater and surface water quality and quantity. Provide additional resources as possible to expand the monitoring network throughout the Umatilla Sub-Basin		
Groundwater Characterization and Optimization Modeling	**2009 -** Begin dedicating financial resources to match federal funds. (Note: non-federal financial and in-kind match would be approximately $2-4 million for full study) **2010 –** Anticipated date for full funding of a groundwater characterization study, including water quality, with a work plan approved by the coordinating government entities	**2014 through 2018 –** Develop a consensus based work plan to complete optimization modeling after initial characterization completed. **2018 –** Groundwater Characterization study completed. Begin Optimization Modeling to analyze development scenarios in the basin	


2050 PLAN
Implementation
2008-2010
1) Development of Management Entity (Special District or Legislative Direction)
2) Base (Local) Fund Generation
3) State Matching Funds (e.g. SB 1069)
Fund
Lobby
Policy Coordination
2009 - 2011
- Feasibility, engineering and procurement to implement SB 1069
- Study of developing supply infrastructure to non-resource zones in the lower Sub-Basin
- Match funding to begin groundwater characterization
- Additional Funds for testing recharge with Columbia River Water
- Reservation of Columbia River water to meet deficit reduction/replacement and Phase III needs
- Funding and formation of an interagency review team
1) Develop replacement water rules and banking/brokerage rules
2) Formation of a Rules advisory committee in the Umatilla Sub-Basin
2011-2020
- Full project build out for groundwater right replacement
- O&M costs for the replacement water project, including mitigation and restoration requirements
- Optimization modeling of the groundwater study
- Continuing match funding from the State of Oregon for O&M and mitigation projects associated with development of new water supplies
- Oversee replacement water program
- Oversee monitoring and reporting of the impacts of replacement water and develop a work plan for additional Basin Rule updates
Coordination on Federal Projects
Tribal Water Right Settlement and Phase III MOA
4) Quantification of Tribal Water Rights Claims for DCMI, Instream Flow and Agricultural Use (6-3)
5) No harm to current water right holders
6) WID has water supply satisfied by alternatives other than Umatilla River live flow through Phase III or other means determined through BOR water supply study (6-3)
2008 - 2020
BEYOND 2020 LONG TERM WATER SUSTAINABILITY/GRADUAL AQUIFER RECOVERY
5) Coordinated Basin Rule update
a. Update classifications based on Umatilla Basin water budget and Columbia River findings
b. Co-Adoption by County as land use decision
c. Coordination with CTUIR Water Code updates resulting from Tribal Water Right quantification
6) State, Tribal, Federal and County implementation of Columbia River Management Component
7) On-going State and County funding to aquifer and surface water restoration
8) On-going ground and surface water monitoring and basin rule update via formal State/County partnership

6-1 PLAN IMPLEMENTATION

Implementation of this plan requires two vital components:

1. Establishment of a formal decision making authority
2. Base and Long-Term Funding

Establishment of a Sub-Basin Government Entity

The Task Force recommends that the Board of Commissioners set up, staff and administer the implementation of this plan. It is also very crucial for the Board of Commissioners to begin developing a means to establish base funding to support the effort

To begin the process to implement this plan, the Task Force recommends that the Board of Commissioners pursue a Memorandum of Agreement (MOA) to formally begin the negotiation process. The MOA would allow Umatilla County to work with stakeholders to further detail the scope and management responsibility sought out by this plan, as well as the preferred funding mechanisms and the priorities for which the funding is to be used. One option for Umatilla County is to pursue legislation that provides flexibility in the make-up and funding mechanisms of an inter-jurisdictional water management entity. OWRD has also provided Umatilla County with multiple options to pursue to fit their needs if legislation is unattainable. The options provided by OWRD are included in their comments within Appendix S.

The following is a conceptual list that outlines the purpose for the development of a local management entity (note: This list can be specific to the Umatilla Sub-Basin or can be used for multiple management entities such as by drainage basins included in Figure 17, special district boundaries or as otherwise authorized):

1) The entity could be appointed by the participating governments (Umatilla County, CTUIR, and Morrow County[*]) and would be accountable to the citizens and stakeholders funding the implementation of this plan (note: depending on process pursued this may be by vote of the public)
2) A formal entity to prioritize and coordinate project development with water providers, the technical community, state agencies, and the water users/funding entities
3) The entity should be the lead local negotiating body on any State Rule Amendments and Rules Advisory Committees that impact the Umatilla Sub-Basin
4) The entity should be the administrator of the deficit reduction/groundwater replacement program.

[*] Morrow County included as a potential participating government. The management entity could be developed by Umatilla County if Morrow County does not wish to participate

6) Provide project oversight and administration of groundwater replacement projects for other water demands (e.g. regional water system development)
7) Generate and allocate resources for studies to establish a Sub-Basin water budget and the development of a water optimization model.
8) Oversee the development, use, and updating of the optimization model.
9) Use the model to guide water management decisions and for formulating recommendations for rule changes and state and federal legislation.
10) Define sustainability goals and set targets for aquifer recovery, use, and post-recovery development and use.

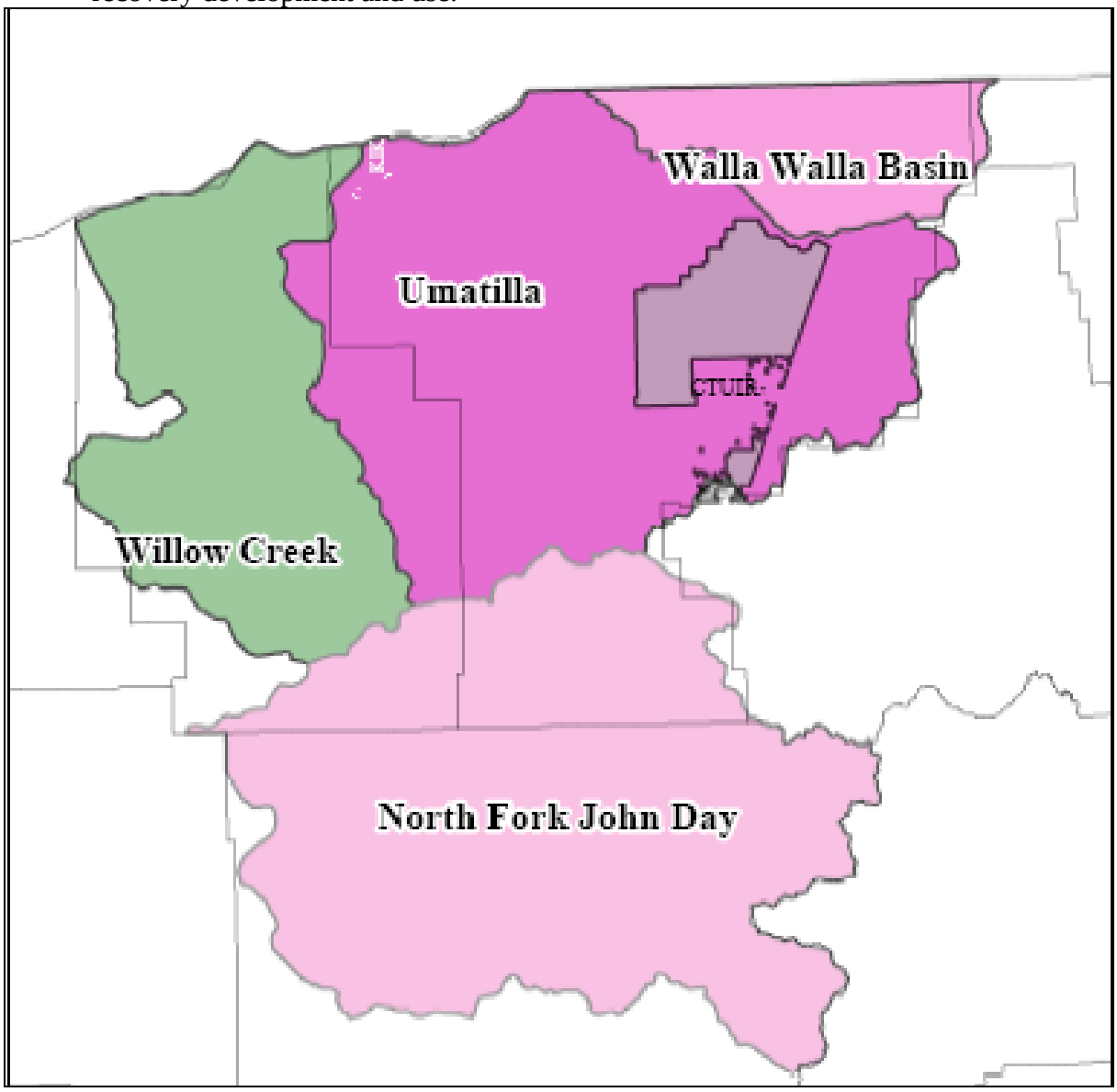


Figure 17: Drainage Basin boundaries of Umatilla County (Note: One concept would be to utilize one or more basin boundaries to establish the jurisdiction of the management entity, and to phase in basins as requested or warranted by projects or water problems)

COC Review Results

A water management authority is perceived by most of the individuals who participated in the plan review to be the cornerstone of 2050 Plan implementation and funding. While a majority of respondents support the concept, there is strong skepticism and concern about its geographic scope and composition, especially from Walla Walla Basin and Morrow County representatives. More than half of questionnaire respondents believe that this management alternative should be pursued; they are also relatively evenly split on the question of its geographic scope.

Strongly disagree	7.5%
Disagree	8.4%
No opinion	22.4%
Agree	29.9%
Strongly agree	31.8%

Countywide	47.9%
Regional	52.1%

Workshop participants and interviewees express strong concerns and skepticism about a new water management entity and suggest that more detail is needed before the concept can be supported. "Better description of its makeup, responsibility and authority is needed." Skepticism centers on the authority to establish such a body, conflicts with OWRD authority, and authority over municipal water uses. Key comments include:

- Review existing options for creating water authorities rather than seeking new legislation and to avoid conflicts with state authorities to manage water resources.
- In recognition of three unique geographic areas within the County, consider creating three separate basin-specific boards or committees that report to a joint board. Under a single Countywide scheme, given population and acreage realities, Umatilla Sub-basin water users will dominate over other users in the County.
- Such a body will need to function with, not in place of OWRD.
- Legislation may be needed to implement the proposal to set up a water management board with very broad authorities including powers of eminent domain, fee authority for well owners, bonding authority, and to create and distribute water through conveyance systems. Details of this concept would be very important. The Task Force needs to review existing statutory options for creating water districts and water authorities under Oregon law before proceeding with this concept.
- A wide range of interests will need to be represented, including small farmers, municipalities, irrigation districts, large irrigators, Tribes, technical representatives (hydrology, geology, fisheries, agriculture).
- If the board represents only the Umatilla Sub-basin, there is the potential to create uneven treatment of water issues in the County.

- Rather than creating a new entity, consider combining with the LUB GWMA Advisory Committee and/or the Umatilla Watershed Council.
- Rather than creating a new entity, use existing watershed councils and conservation district boards.

Umatilla County Action

The Board of Commissioners should complete the steps below to develop a Sub-Basin Governmental Entity. This process should begin as soon as possible, in part, to provide the State of Oregon with an idea of how projects developed as a result of the current SB 1069 work could be administered.

Steps	Entities	Technical Support
Step #1: Umatilla County Board of Commissioners establish a new charter and/or by-laws for an interim committee to continue working on implementation of 2050 Plan and work through the 2009 legislative session. This processes should provide clarity regarding the geographic scope of the government entity	Umatilla County Board of Commissioners and Umatilla County Critical Groundwater Task Force members	Legal Counsel, Umatilla County RS&D Department
Step #2: Umatilla County CTUIR and Morrow County[7] Enter into a Memorandum of Agreement to form a Joint Water Use Committee and/or Special District	Umatilla County Board of Commissioners, CTUIR, Morrow County Court	Legal Counsel, Umatilla County RS&D Department Governor's Office, Legal Counsel, OWRD, CTUIR Water Resources, CTUIR Environmental and Rights Protection, LUBGWMA Committee, UBWC, SWCD, Port of Morrow, Port of Umatilla
Step #3: Complete negotiations regarding the scope of authority (i.e. funding, allocation of funds, project development, monitoring, Rules Advisory Committee coordination, etc.) and district boundaries for a Joint Water Use Committee or Special District	Umatilla County and Morrow County Water Providers (e.g. irrigation districts) Umatilla County and Morrow County Groundwater Irrigators Morrow County and Umatilla County Municipalities	
Step #4: Umatilla County, CTUIR and Morrow County Enter into an Intergovernmental Agreement, establish by-laws, establish district boundaries and generate base funding	Umatilla County and Morrow County Water Providers (e.g. irrigation districts) Umatilla County and Morrow County Groundwater Irrigators Morrow County and Umatilla County Municipalities	
Step #5 Joint Water Use Committee formed, funded and staffed to manage district boundary(ies), implement and manage projects, oversee funding, debt obligation and cost share		

[7] Recommend the Board of Commissioners encourage Morrow County to participate in further planning efforts

Funding

With exception to the Umatilla Basin Project there is a lack of resources and financial commitment from the local, state and federal governments to implement any of the proposed water planning, development and mitigation projects in the Sub-Basin. Local match and local funding commitments are necessary to secure financing requirements of new projects, new federal appropriations and/or small and large federal and state grants. Without financial commitment it is difficult to prove to state and federal legislators that Umatilla County is committed to long term water sustainability.

Reliable financial backing and financial accountability to stakeholders is critical to implement the water sustainability options in this plan. Additionally, reliable financial resources make it possible to continue with the operation and monitoring of restoration projects, development and implementation of new projects, studies and monitoring, regulation and policy updates.

Historically, the financial burden of water projects has rested with one or more water users that propose the project. Large scale water projects are virtually unattainable by average water users due to the debt load of a large project. It is recognized that all citizens of the Sub-Basin will benefit from the successful implementation of this plan. Therefore, funding mechanisms that take into account direct and indirect benefits of water sustainability planning and projects must be developed to assure that all water users share in the commitment to long term water supply.

2050 Plan Goals Addressed

7 projects and funding

COC Review Results

While participants in the process tend to support this management strategy as a necessity for Plan implementation, there is widespread skepticism about its public acceptability without better explanation of the purposes of a well head fee or other financing mechanism, exactly what it would be used for, how it would be administered, etc. Among questionnaire respondents, there appears to be more resistance to this concept than to any other management alternative asked about.

Strongly disagree	26.9%
Disagree	5.8%
No opinion	26.0%
Agree	28.8%
Strongly agree	26.9%

Workshop participants and interviewees are almost unanimous in the comments that more detail is needed and that there is likely to be strong resistance without significant public education efforts. Other concerns expressed include:

- To be equitable, any fee has to be imposed on every source of water.

- Would inactive wells be charged?
- How would a flat tax work in smaller versus larger cities?
- It looks like the Plan's only purpose is to establish seed money.
- Any funds raised will need to be kept out of the County budget or they will be diverted to other uses.
- Any fee structure should be voted on by the people, especially when resource development is driven by benefit. There must be a nexus between fees and benefits.

While there is a split in opinion, significantly more questionnaire respondents believe that a water use fee should be applied Countywide rather than limited to the sub-basin.

County	59.8%
Regional	40.2%

- If a Countywide fee is charged, there will need to be Countywide representation in the decision-making on projects to fund and projects in each basin will need to be funded.
- Don't tax Ukiah or Milton-Freewater for a Hermiston solution

Funding Recommendations

Base Funding: Use current special district formation rules or propose new enabling State legislation to create a local option measure to implement a funding mechanism, such as a well head fee or other scenario that is based on water use and economic benefit, in Umatilla County (or parts thereof). The well head, or alternative fee structure, would be utilized to provide initial base funding and potential long-term funding for groundwater studies, supply and restoration projects (e.g. groundwater replacement projects), operation, maintenance and monitoring.

The gradual recovery scenario that has been endorsed by this plan benefits all water users.

a. Providing adequate surface water supplies to replace existing groundwater rights directly benefits irrigators and the irrigated agricultural economy but it indirectly benefits the economy in several ways:
    i. Taking the primary groundwater consumers (irrigation) off of groundwater increases the likelihood of long-term sustainable groundwater supplies for exempt users, public water supply districts and municipalities who rely on groundwater for their potable water supply needs.

ii. Most groundwater supplies, especially in the confined basalt aquifer system, are already potable. Therefore, groundwater is a more economical water option for municipalities by enabling them to provide potable water without the added expense of major treatment facilities.
iii. By taking the majority of deep basalt groundwater users off of the groundwater resource, it allows for a more reliable groundwater characterization study. As an example, OWRD usually completes all or a portion of their annual synoptic sampling in the winter and early spring due to less interference from groundwater pumping.
iv. By taking the majority of deep basalt groundwater users off of the basalt resources it allows for natural and artificial recharge/aquifer recovery opportunities.
v. By increasing the amount of groundwater in storage, the likelihood of withstanding a long-term drought situation is increased. A long-term drought would require a significant portion of water use to come from the basalt groundwater aquifers. This is due to the fact that most alluvial aquifers and all surface water resources in the sub-basin are influenced by annual precipitation. Ensuring that basalt groundwater is available when surface water supplies and alluvial aquifer supplies are scarce would allow all water dependent uses including exempt, irrigation, municipal and industrial to continue.

b. Developing water supply sources during the winter months, or months when additional appropriation is scientifically or politically defended to provide water to existing groundwater users directly benefits the water user but also directly benefits other human and non-human users of the resource in several ways:
i. Taking water from the Columbia River, Umatilla River or its tributaries during the high flow months instead of the summer months ensures that water will be available for migrating salmonids and resident fish when they need it most
ii. The migrating salmonids and resident fish of the Columbia River and its tributaries provide for a very strong commercial fishing and recreational fishing economy, as well as a tribal subsistence fishery throughout the Columbia River network and throughout the Pacific Northwest.

iii. Taking water during available times ensures that water is available to meet fishery needs that support the coastal, mainstem and tributary recreational and commercial fishing economies.
iv. Taking water during times when Columbia River reservoirs are full ensures that water withdrawals have minimal impact on the hydroelectric system of the Columbia River.
v. Taking water during the above times ensures that the existing summer rights and flow augmentation needs are not impacted by new, junior uses.
vi. Utilizing conveyance infrastructure, surface water storage and alluvial/basalt storage during the winter months promotes increases in base flow and water quality through dilution and groundwater movement to surface water sources.
vii. Increased base flow decreases water temperature and water quality degradation, benefitting both alluvial groundwater quality and surface water quality.
viii. Most Umatilla Basin streams have a TMDL for water temperature and turbidity.
ix. Utilizing aquifer recharge in the winter months may decrease turbidity concentrations and summer time temperatures through base flow augmentation which will be a direct benefit water quality.

2. As identified in this plan, supply is not the only funding need to assure ground and surface water sustainability
    a. Dedicated funding is necessary to conduct the scientific analysis needed to analyze and quantify the hydrologic connection between surface and groundwater resources. This analysis will help prioritize watershed restoration projects and minimize interference between ground and surface water users.
    b. Dedicated funding is necessary to complete a groundwater characterization model that will establish groundwater availability, guide classification policy and regulation, and minimize interference between senior and junior groundwater users.
    c. Dedicated funding is necessary to enable watershed councils and the OWRD to fund and protect worthwhile restoration projects.

3. There is a significant investment in groundwater development and use

a. Umatilla County is a major food producing county in the State of Oregon.
b. Irrigated agriculture has made a significant investment in developing, perfecting and utilizing groundwater rights. It is not fair to the irrigation community to require them to bear the burden of re-investing in additional water supplies and infrastructure if it is intended to benefit more than just the irrigated agricultural community and economy.
c. While domestic wells use an insignificant amount of water in the Umatilla Sub-Basin they are vital to the needs of County farmers and rural residents as well as for other business and industry uses which do not have a municipal water supply available. It is estimated that there are approximately 5,500 exempt domestic wells in the Umatilla Basin. These wells supply a relatively clean, safe, and economical onsite source of water to dwellings. Based on an estimated cost of construction of a domestic well at $5,000, the capital investment in existing wells in Umatilla County exceeds $27,500,000. At $7,500 per well this investment exceeds $41,250,000.
d. It is important to note that while exempt wells are insignificant compared to large scale water users, they still contribute to groundwater consumption and should share in the protection of their investment.
e. Ground and surface water sustainability is a major component to a diversified economy in both the lower and upper Umatilla Sub-Bain.

4. Surface water supplies and delivery infrastructure are currently available but the costs to tie into these systems are usually not feasible without assistance.
    a. Incentive opportunities to promote additional development of the Port of Umatilla/City of Hermiston Regional Water System to provide water to a diversified economy must be developed to ensure economical water supplies for current and future economic development.

County Action

Umatilla County shall begin the process of establishing a fee or taxing mechanism to provide base funding to match state and federal cost share and/or debt load requirements generated by project implementation. The bulk of funding generated should go to supply, restoration and mitigation projects with a set amount being set aside to match federal and state contributions to a regional groundwater characterization study. Assuring that funding will be split between efforts may result in quicker completion of necessary groundwater studies that is required to establish a defensible water budget for the Sub-Basin.

Clarify District Boundaries and Residents/Interests served

In conjunction with providing clarification on the oversight of a management entity, it is recommended that the Board of Commissioners begin coordinating with Morrow County and the Walla Walla Sub-Basin to address county-wide vs. regional (e.g. watershed) funding opportunities. If work on SB 1069 continues, the area to be served by SB 1069 projects could be utilized as a pilot project to test a phased funding and management approach vs. instituting a county wide program.

Based on comments received from the Walla Walla Basin it is recommended that the commissioners and/or any interim committee appointed by the commissioners consult with the Walla Walla Basin regarding their efforts and potential linkage to this plan.

Funding Option #1

Develop Base Funding by assessing a fee on every well head and water right in the Umatilla Sub-Basin, or based upon sub-districts within the Umatilla River Watershed

- Develop and lobby for new enabling legislation, if needed, to allow Oregon Counties and/or the State of Oregon to levee fees on established water rights and developed water sources (Example provided as Appendix A)
- Umatilla County to work either independently or through the government entity MOA to establish base fees on each well head owner in Umatilla County, and additional fees for significant water users (i.e. water right holders
- Appendix C provides some conceptual ideas on fee allocation and potential revenue generation
- Utilize the formal MOA/IGA process or establish Umatilla County By-laws to govern the use of generated revenue and assure accountability to stakeholders
-

Funding Option #2

Develop a funding formula based on the formation of a special district

- Two Umatilla County examples of special district funding that assess fees based upon impacts to (i.e. use of) a water system are the Marion Jack Improvement District and McKay Acres Improvement District
- District formation and allocation of fees could be established similar to Option #1 above (e.g. based on water demand) but tied to real property not well head and/or place of use described above.

- District boundaries could be phased in based on priority (i.e. CGA's, West County, Etc. which could assure that fees generated within each district are used for the benefit of that district, as opposed to a county-wide fee structure
- If this option were to be chosen, Umatilla County would need to be provided with a more accurate assessment of water use in the Umatilla Basin
- OWRD through the Oregon Water Supply and the work products of SB 1069 could produce the most current and accurate water rights map in the Umatilla Basin, specifically the areas encompassed by and directly adjacent to designated CGA's.
- Current water supply studies should conclude in 2008 prior to the Oregon State Legislative Session which could enable Umatilla County to move forward in late 2008 or early 2009

State Match Funding: Continue to lobby the State of Oregon to provide state funding directly to water supply planning and project implementation.

1) Prior to the passage of the Oregon Water Supply and Conservation Initiative and SB 1069, OWRD did not have technical assistance grants or other funding mechanisms to assist with water development, study, monitoring, conservation and other projects that could improve the water supply picture for all areas of the state.
2) The Governor's Office and the Oregon Water Resources Department are requesting additional funding to provide a state investment in water sustainability
3) The State of Oregon relies heavily on water for its economy
   a. Columbia Basin and Willamette Valley: Tourism, Commercial fisheries, Tribal economies, transportation, urban and ag economy
   b. Coastal: Tourism, commercial fisheries, urban and Tribal economies
   c. Southeast and south central: Tourism, transportation, urban and agricultural economies
   d. Based on this reliance water should be of the utmost importance when considering the states economic strategy

4) Water related investment by the state must continue to prevent statewide water conflicts related to surface and groundwater quality and quantity and to enable long term state funding to assure water security for all economic and environmental endeavors in the State of Oregon.

Umatilla County Action (State Match Funding)

Work with other statewide and basin stakeholders to provide a presence in Salem, and to fund significant lobbying efforts to promote the significance of water supply investment in the State of Oregon. Umatilla County should work to establish a coordinated effort to promote both basin wide and state wide consensus on water supply sustainability.

6-2 Meeting Current Water Demands

Critical Groundwater Areas and Lower Umatilla Sub-Basin

In the designated Critical Groundwater Areas (CGA), there are a significant number of certificated groundwater rights that are still valid, but are not allowed to be used because of current allocation scenarios in the CGAs. This section of the 2050 Plan considers how best to reduce the deficit of water availability ("deficit reduction") in CGAs to existing certificated water right holders.

The Critical Groundwater Orders in Umatilla County are as follows:

(1) Groundwater resources of the basalt aquifer and shallow gravel aquifer within the Ordnance Critical Ground Water Area are closed to further appropriation by Order of the Director dated 1976.
(2) Groundwater resources of the basalt aquifer in the Stage Gulch Ground Water Study Area are closed to further appropriation by Order of the Director dated 1991.
(3) Groundwater resources of the basalt aquifer within the Butter Creek Critical Groundwater Area are closed to further appropriation by Order of the Director dated 1986.
(4) (Morrow County) Groundwater resources of the basalt aquifer within the Ella Butte Ground Water Study Area (previously classified as Critical Ground Water Area in 1985) are classified for statutorily exempt uses only by order of Proclamation by the Director dated 1985.

The allocations allowed in the CGAs have resulted in decreased amounts of irrigation water and therefore irrigated acres within the CGAs. Lack of current groundwater availability in the CGAs and uncertainties over future groundwater availability has resulted in reduced economic development opportunities for value-added agricultural production and other industrial and commercial projects in these areas. Until there is more certainty with respect to the availability of groundwater to meet the allocated and unallocated water rights in these areas, it is very difficult to plan for future development and agriculture endeavors that would need new water rights.

The intent of this management alternative is to create a sustainable, balanced deficit reduction plan that maximizes the opportunities for existing water rights holders to use their water rights (allocated and unallocated) and that minimizes conflicts over water uses and regulatory oversight.

The proposal to completely eliminate the deficit in water availability to existing water right holders in the CGAs is:

- Utilize available Columbia River water to relieve water supply deficits in the Umatilla Basin. The term “available Columbia River water” means the water in excess of the quantity necessary to protect and maintain (water quality, stream flow and flow velocities) the fishery in the Columbia River. In addition to a need for Columbia River water, there is a need to address the following:

- The current social and regulatory hurdles to achieve deficit reduction through Columbia River water development
- And, potential regulatory hurdles that limit the ability to protect the Columbia River water made available for the purpose of deficit reduction on lands with current groundwater rights
- And, regulatory hurdles that limit the ability of water rights holders to optimize the use of water made available for deficit reduction

Why Needed for Gradual Recovery

According to USGS reports, groundwater recharge to the basalt aquifer in the entire Umatilla sub-basin ranges from 10,000 to over 64,000 ac-ft per year. [22] Assuming that these figures are accurate, the basalt groundwater rights in the three basalt critical groundwater areas exceed the maximum estimated natural recharge by 109,466 ac-ft.

By contrast, the annual basalt groundwater use by all Sub-Basin municipalities (9 municipalities) in Umatilla County is approximately 12,095 ac-ft. The current municipal consumption is within the natural recharge range estimated by the USGS. The total undeveloped permit rights (+/- 126,680 ac-ft) exceeds the natural recharge estimates of the USGS but this represents full build out of municipal water rights that will not occur in the near future.

Therefore, addressing basalt irrigation rights is a major component and the recommended first step to begin the process of gradually recovering the basalt groundwater system.

A water right is a vested property right. A water right may not be altered by local regulations, nor may it be taken by local or state government without due compensation. To protect rights granted under existing water law in the State of Oregon, steps need to be taken to ensure that the full amount of water is provided, first, to existing water rights in CGAs.

Recommended Project(s)

Deficit Reduction and Groundwater Replacement: Appropriate new surface water right(s) from the Columbia River to use as replacement water for existing unallocated groundwater rights within designated Critical Groundwater Areas and potentially .

Summary:

1) The CGA's of the lower Umatilla Basin currently encompass approximately 190,000 acre-feet of alluvial and basalt groundwater rights (see figure 19 for a breakdown of allocated and unallocated water rights).

2) Approximately 127,038 acre-feet are currently unallocated (cut off) due to significant declines in groundwater resources (67% reduction).

3) Basin and Subarea's Shortage Total %Short

Stage Gulch CGWA *Subareas B, C, D, E, & F*	11,916	16,116	74
Stage Gulch CGWA *Subarea H*	9,300	18,150	51
Stage Gulch CGWA *Subarea G*	9,922	12,672	78
Stage Gulch CGWA *Subarea A*	21,521	32,971	65
Butter Creek CGWA *South Subarea*	1,598	2,598	62
Butter Creek CGWA *Pine City Subarea*	7,658	11,808	65
Butter Creek CGWA *West Subarea*	39,396	45,066	87
Butter Creek CGWA *East Subarea*	1,650	2,370	70
Butter Creek CGWA *Fourmile Canyon Subarea*	3,764	5,064	74
Butter Creek CGWA *Echo Junction Subarea*	9,846	11,106	89
Butter Creek CGWA *Section 21 Subarea*	24	52	46
Butter Creek CGWA *North Subarea*	2,443	2,693	91
Ordnance Basalt	0	6,800	0
Ordnance Gravel CGWA	8,000	17,000	47
Westland Road Subarea	0	6,000	0
Total shortage of water in all CGWA'	**127,038**	**190,466**	**67%**

4) Due to existing uncertainty on the status of available Umatilla River (winter and early spring) water and the relatively close proximity of the CGA's to the Columbia River, available Columbia River water is the most sustainable source to complete deficit reduction.

5) Due to the extent of the deficits and current flow protections placed on Columbia River withdrawals, direct Columbia River supply of 190,000 acre-feet during the irrigation season is not politically doable and would require extensive mitigation actions. Even if direct supply during the flow augmentation period were to be allowed by state legislation today, the water supply would likely be subject to long term litigation and may be in danger of costly impacts resulting from a finding that the water has resulted in ESA takes now or in the future.

6) Columbia River water will have to be supplied via a combination of supply mechanisms including direct supply, supply to alluvial storage in winter months, and supply in winter months to new and existing surface water storage sites in the lower Sub Basin.

7) The storage capability of the alluvial aquifer and multiple surface water impoundments have been studied heavily by BoR and other entities.

8) OWRD, through the Oregon Water Supply and Conservation Initiative continues to assess the feasibility of ground and surface water storage.

9) The Task Force has identified projects that could be developed in the Sub-Basin, as well as the locations and water rights that would most likely benefit from such projects (project table included as Appendix D)

10) Existing studies reveal that surface and groundwater storage for +/- 190,000 acre-feet is attainable in the Sub-Basin and future studies will assist in identifying which projects are the most feasible.

11) Even though the storage is available, funding is necessary to assist with identifying the most feasible projects, design, procurement, construction and maintenance of such assets.

2050 Plan Goals Addressed

1 sustainability, 4 surface and groundwater connection, 6 current and future needs, and 7 projects and funding

COC Review Results

There is strong support among those that participanted for this management alternative, the only hesitations being the potential costs of the projects. Over 70% of questionnaire respondents are in support.

Strongly disagree	4.5%
Disagree	5.5%
No opinion	19.1%
Agree	20.0%
Strongly agree	50.9%

A number of workshop participants and interviewees suggest that more clarity is needed on the overall purpose of the Columbia River withdrawals, e.g. that replacing groundwater rights is intended to recharge aquifers. The potential infrastructure and energy costs are a common concern. Taking advantage of the infrastructure that is currently in place is recommended to reduce costs. Several reviewers note that the Plan proposes to utilize existing infrastructure, but it is unclear about how and to what degree. Participants and interviewees support for the general concept of withdrawing available water from the Columbia as they feel that Oregon has not withdrawn its fair share in relation to Washington and Idaho.

Participants request that the Task Force consider additional actions to obtain water to reduce groundwater deficits, including:

- Raise the water level of McNary and John Day pools
- Raise the level of McKay Reservoir
- Develop upstream small-scale storage sites
- Release water from Grand Coulee Dam

Based on the strong support for this alternative it is important that the county move forward as soon as possible. Additionally, it is recommended that the county make every effort to assure that the new water supply developed out of the Columbia River is used to replace groundwater rights. Once the rights are replaced it is important to note that a water brokerage system and district boundaries be implemented to allow users to optimize the use of the new water and lease or sell water to one another.

Umatilla County Action (Deficit Reduction/Replacement Water)

- Obtain a legislative reservation for approximately 195,000 acre-feet of Columbia River water contingent upon a management body forming to oversee the water right permit and project development
- Lobby for State Funding and Legislative/Governor Direction to Form and staff an Interagency Review Team under OAR 690, Division 33 to address potential fish and wildlife impacts and water quality issues. develop a mitigation/restoration plan (note: currently OWRD waits to consult formally with DEQ, ODA and ODF&W until a water right application has been submitted)
- Develop a board of control amongst current surface water providers (e.g. irrigation districts) to utilize existing infrastructure to deliver water to supply existing groundwater right holders (general concept on management and oversight provided in figure 18)
- Work with OWRD to propose revised water supply management rules to protect the new water supplies for the purpose of deficit reduction and gradual recovery of the basalt aquifer.
- Request assistance from WRC and OWRD to develop a water brokerage and banking system via the development and adoption of new rules to maximize options available to current water rights. The rules should be developed to allow water right holders to utilize, lease or sell all or a portion of the new surface water supplies made available to them through the deficit reduction/groundwater replacement program. (note: the first step is to make the water supplies available. The deficit reduction rules may be negotiated following the development of surface water supply, surface water storage facilities, aquifer recharge and/or aquifer storage and recovery facilities
- Work with sub-basin water users and the SB 1069 contractors and work group to determine economically feasible area(s) to provide replacement water from the Columbia River (John Day and McNary Pools). Currently, the economically feasible area is being addressed based on area of need and pumping costs due to elevation and distance from the Columbia River. Figures 20 through 22 display the realistic area where Columbia River water could be delivered economically based on pumping costs. The figures provide a clear picture, based on existing infrastructure and elevation contours, that pumping costs may limit Columbia River water development throughout the Sub-Basin but could be used for groundwater replacement in the Lower Sub-Basin. These areas could dictate where initial boundaries form as Umatilla County moves forward with implementation.

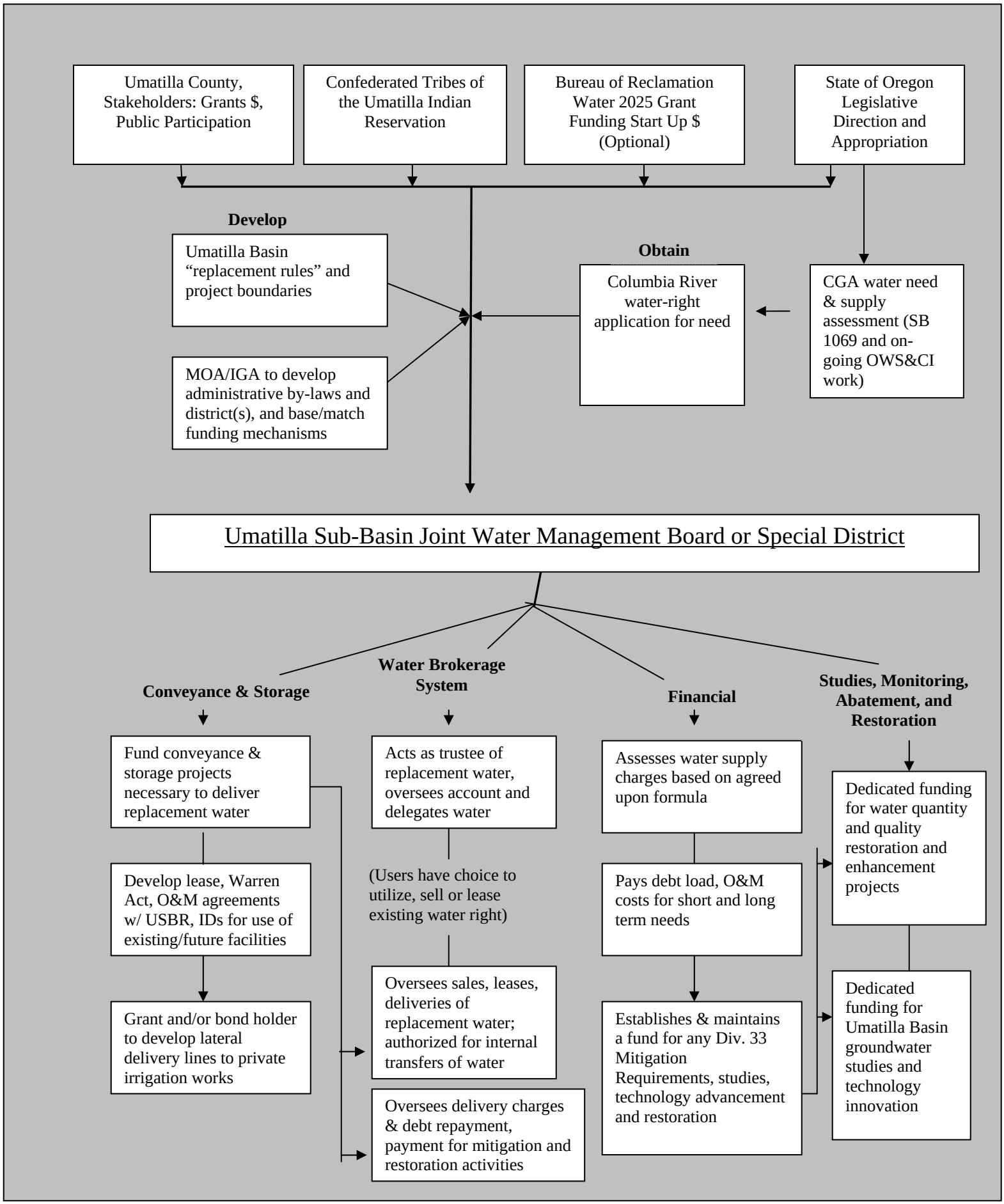


Figure 18: Conceptual scope of authority to implement Groundwater Replacement

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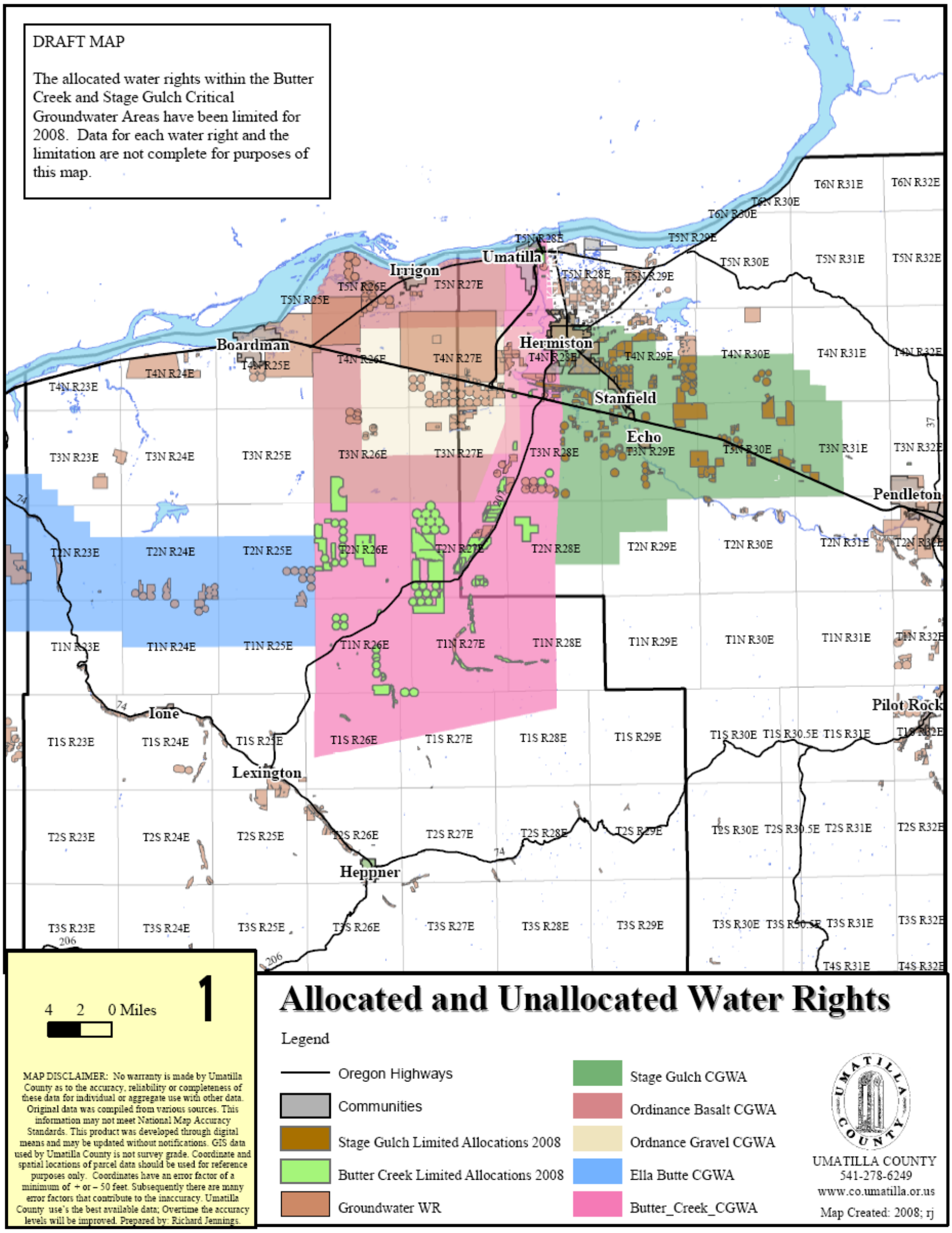


Figure 19: Allocated and Unallocated water rights in the Lower Sub-Basin (not to scale)

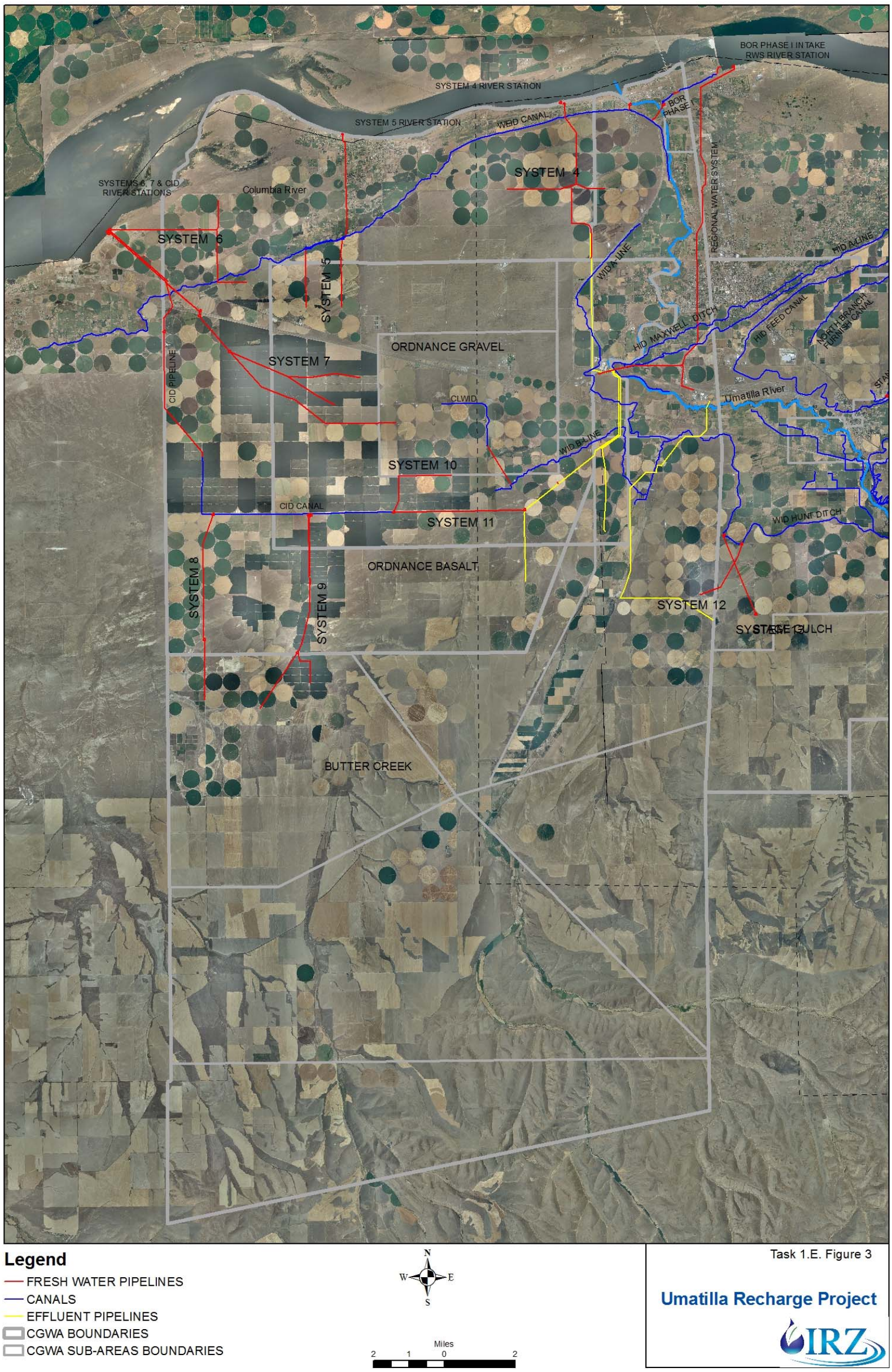


Figure 20: West County Infrastructure (IRZ)

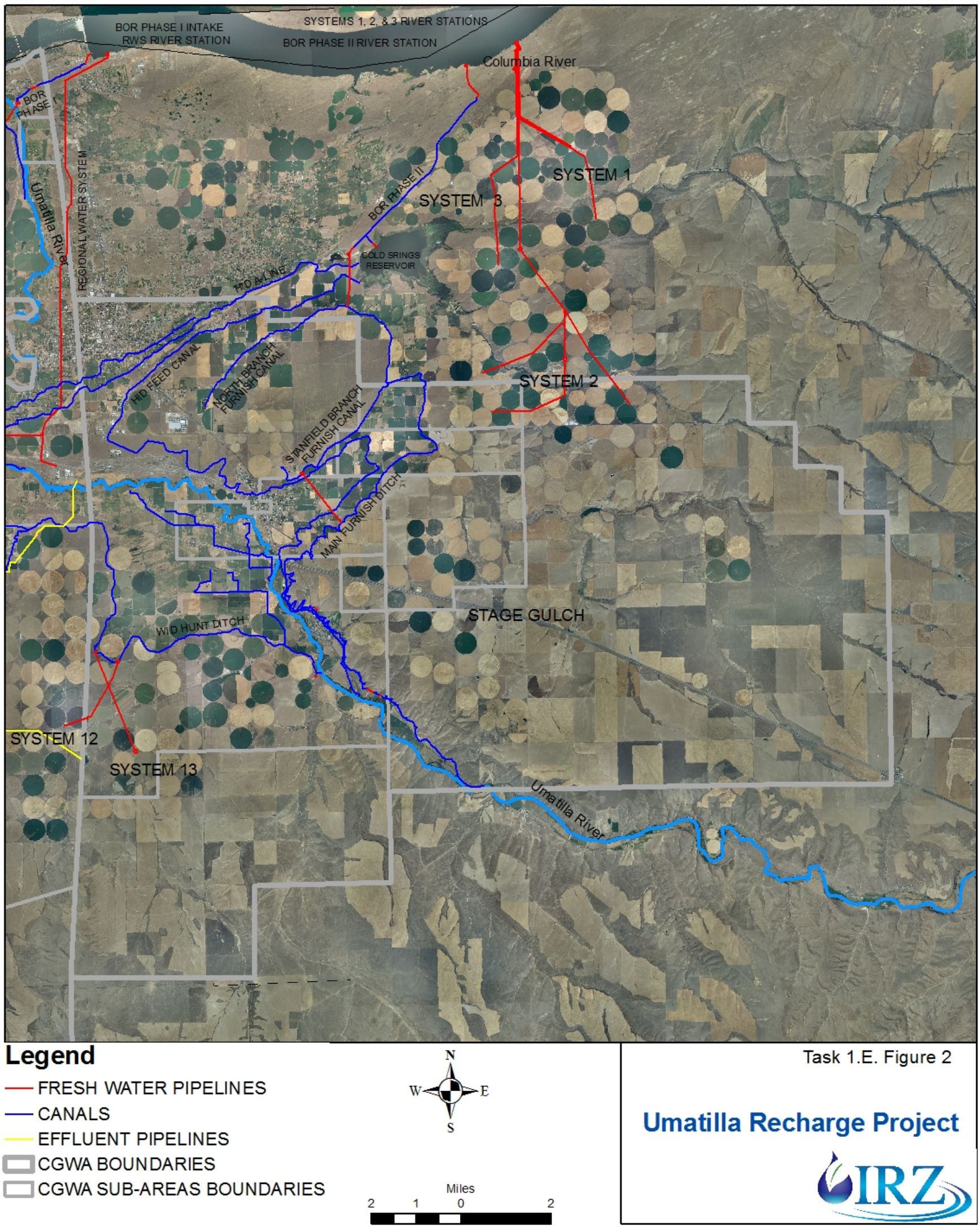


Figure 21: Stage Gulch CGA Infrastructure Options (IRZ)

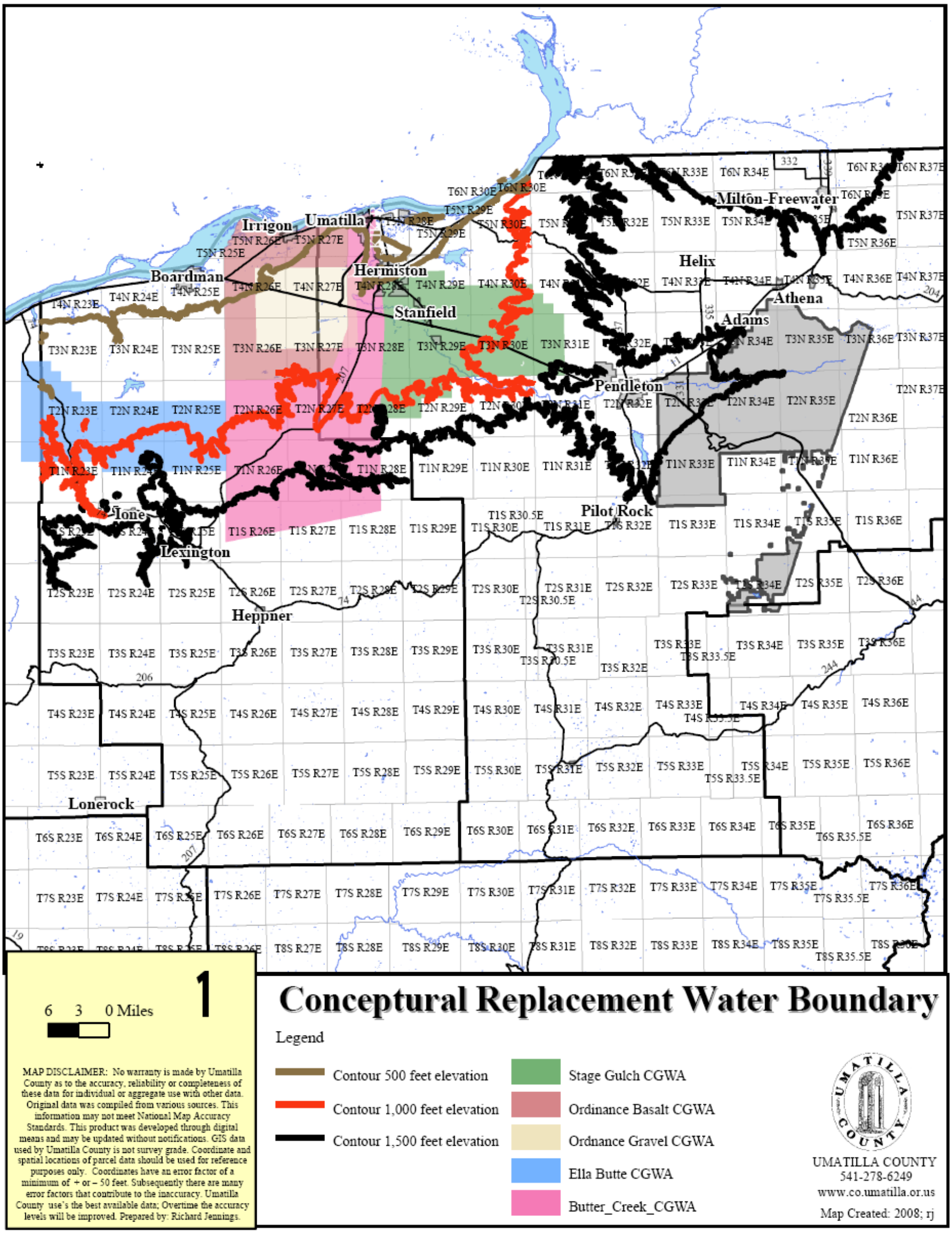


Figure22: Conceptual Replacement Water Boundaries Based on Economical Pumping Elevations (Draft - Not to Scale)

Other Current Water Demands

In addition to basalt and alluvial groundwater irrigation rights, the Sub-Basin encompasses many other types of water supply demands that utilize all three categories of water supply; surface, ground and storage. As an example, figure 23 illustrates all of the water right demands on the Umatilla River in relation to the actual water supply.

These other water demands include existing and future groundwater uses, proposed rural commercial and industrial development inside and outside of CGAs, full or partial exchange of Westland Irrigation District water supplies, and settlement of CTUIR water claims/rights. These water demands are important enough to warrant Board of Commissioner involvement and formal recommendations in this plan to assure that all potential water demands, not just irrigation needs, are addressed.

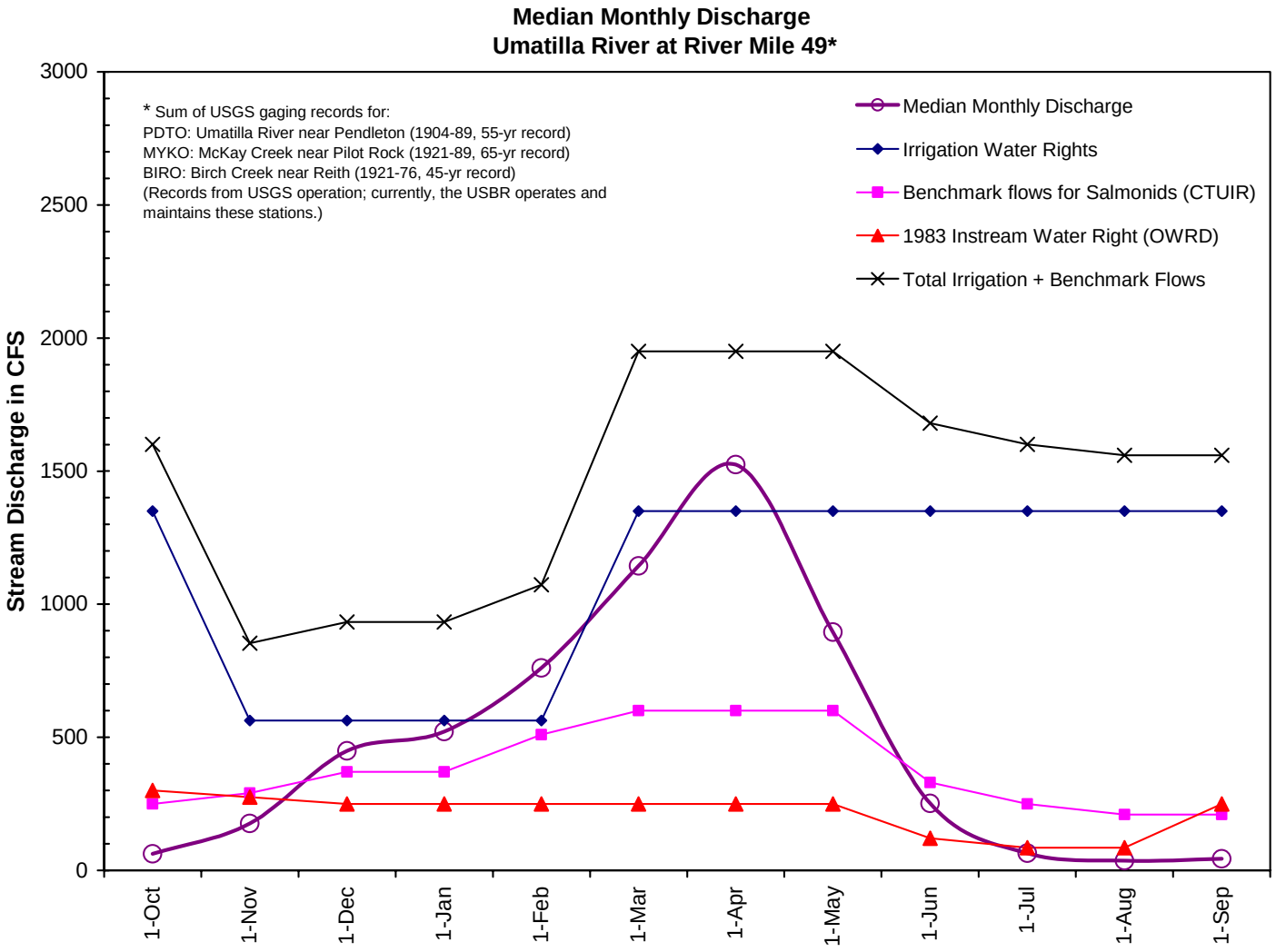


Figure 23: Water Demands on the Umatilla River

This 2050 Plan is designed to prevent conflict and uncertainty between existing and proposed water developments in the Umatilla Sub-Basin. This section addresses the following issues and opportunities regarding water demands other than groundwater utilized for irrigation:

- Provide adequate water availability for all needs in the Umatilla Sub-Basin
- Assure that future water development from the Columbia River or other water sources does not compromise the Umatilla Basin Exchange Project or local economy.[23]
- Develop funding opportunities in the lower basin to pursue alternative water delivery opportunities such as aquifer recharge, aquifer storage and recovery and rural water districts
- Minimize new use of Umatilla River flows and groundwater in the lower basin so that these water supplies are available for upper basin uses, including the unquantified water claims/rights of the CTUIR , where use of Columbia River water is currently not feasible due to pumping costs and lack of infrastructure
- Prevent basin-wide over appropriation of the basalt groundwater resource
- Develop projects that benefit both water quantity and quality
- Restore stream flow in the Umatilla River during low-flow periods to enhance salmonid, bull trout and other aquatic habitat. Restoring habitat through conjunctive projects will benefit the environment and increase the likelihood of meeting in-stream treaty obligations. Habitat restoration and a properly functioning ecosystem may increase recreational opportunities, economic benefits and decrease the likelihood of litigation due to environmental impacts.

Why Needed for Gradual Recovery

This section of the plan is intended to promote implementation of the gradual recovery goal in conjunction with other on-going water management projects that are in various stages of implementation. Additionally, this section has been developed to assure that the gradual recovery goal is not pursued at the expense of surface water and groundwater quality and quantity.

Recommended Involvement in On-Going Federal Projects

Support the Establishment CTUIR's Water Rights and Development of Phase III of the Umatilla Basin Project, While Protecting Existing Non-Indian Water Rights

The goal of the Umatilla Basin Project Phases I and II was to restore the Umatilla River stream flows, thereby satisfying a part of the water needs (instream flows) of the CTUIR, while protecting water used by the irrigation districts. In fact, the goal went beyond "protect" to "make the irrigation water supply even better". That goal has been achieved. Success was possible because "new" Columbia River water was developed and because the commitments among the parties – to restore stream flows and recover salmon and to protect existing irrigation uses – were fully upheld.

The following list provides additional documentation to support Umatilla County involvement in these on-going federal efforts:

1) The 1986 Report to the Governor from the Umatilla Basin Groundwater Task Force found that there was a need to address and quantify the water rights of the CTUIR.[24]
2) The 1988 Umatilla Basin Report addresses the fact that tribal reserved water rights were not prominently addressed in the development and regulation of Sub-Basin water supplies up to 1988, and that claims by other Indian Nations have a history of being upheld across the United States.[25]
3) The CTUIR has continued to work with Umatilla Basin, specifically Sub-Basin stakeholders to plan and develop sound water projects and policy that benefit multiple water users and protects existing water rights.
4) The CTUIR continues to assert that no harm will be allowed to existing, non-tribal, water rights holders in the fulfillment of the CTUIR water rights claims, and that fulfillment of CTUIR water rights claims will benefit both the tribal and non-tribal economies of the region.
5) The CTUIR, through Stetson Engineers, Inc, have released a water rights claim to meet the following on-reservation and off-reservation needs:
    a. Domestic, Commercial, Municipal and Industrial (DCMI) - 13,500 acre-feet
    b. In-stream – 310,500 acre-feet
    c. Irrigation – 50,000 acre-feet
6) The CTUIR water claims are larger than the amount classified for CTUIR use in current Umatilla Basin Rules (75,000 acre-feet) and may impact future non-tribal appropriations from groundwater supplies, the Umatilla River and its tributaries.
7) Quantification and fulfillment of the CTUIR water claims will allow continued economic certainty and sovereignty for the CTUIR as well as provide certainty for the state and local agencies regarding water sources available for current and future development in the Sub-Basin.

The next phase of the Umatilla Basin Project, to be defined by the ongoing federal and state water supply projects, will finish the process by providing water to replace Westland Irrigation District's Umatilla River irrigation water supplies, and to supply water for the Umatilla Indian Reservation. Westland Irrigation District uses or supplies approximately 75,000 acre feet of water annually of both live flows from the River and stored flows from McKay Reservoir.

In 2005 Westland and the CTUIR signed a binding agreement to implement a formal assessment of the Tribe's water rights and a federal study of the new water supplies that would be required to provide the water needed by the CTUIR. Both projects – assessment of the CTUIR water rights and a study of Umatilla Basin water supply needs - will be completed in late 2008 or early 2009. Westland and the CTUIR have agreed that only after completion of the Assessment Team's report and the Water Supply Team's report will the parties consider taking the next step to request the establishment of a negotiating team and implementation of a federal feasibility study. It was a federal feasibility study that led to the 1988 Act and construction of the Umatilla Basin Project.

It is the expectation of both CTUIR and Westland Irrigation District that the next phase of federal water supply development in the Umatilla River Basin will provide the new water supplies needed for the Basin and for the CTUIR water needs and rights. Once projects such as the third phase of the Basin Project are defined, funded by Congress and constructed, satisfaction of the CTUIR water needs and ultimate settlement of their water right will be possible. And, the Basin will have certainty regarding needs and jurisdiction of ground and surface water rights.

2050 Plan Goals Addressed

1 sustainability, 4 surface and groundwater connection, 6 current and future needs, 7 projects and funding and 9 consensus

COC Review Results

There is less support for this strategy to reduce groundwater deficits, with about 55% of questionnaire respondents in agreement.

Strongly disagree	15.3%
Disagree	7.2%
No opinion	22.5%
Agree	21.6%
Strongly agree	33.3%

Workshop participants and interviewees were more supportive as they appear to better understand that the two management alternatives are interconnected and interdependent.

A key concern expressed is the need for and appropriateness of a management alternative in the Plan that addresses Tribal water claims. "Why is this even part of the Plan?" Several participants assert that the Task Force and the County have no authority over this issue and that it detracts from the rest of the Plan. "It is an important issue and should always be taken into consideration when water resources are evaluated; but it should not be articulated as a Plan project." Conversely, it is asked how the Plan can move forward until these claims are settled. Concern is expressed about both the costs to County taxpayers to develop the necessary infrastructure and the costs of County involvement in the claims adjudication process.

While it is true that Umatilla County has no authority to settle CTUIR reserved water rights claims in the Umatilla Sub-Basin, the Task Force recognizes that sustainable use and management of the Sub-Basin's water resources depend to a large degree on the resolution of CTUIR's water claims. The development and use of water resources off the Umatilla Indian Reservation affects the settlement process and the settlement outcome affects water availability, development and use on and off the Reservation. In addition, the outcome of the settlement process provides much-needed certainty about the availability of water resources for future use in the Sub-Basin. Projects derived from the settlement that provide water to the Umatilla Indian Reservation, augment stream flow

and improve water quality in the Umatilla River may provide opportunities to meet the groundwater replacement and gradual recovery goals of this Plan.

In the past 20 years, coordination and cooperation among the Sub-Basin's stakeholders have been the hallmark of comprehensive management and development of the Umatilla Basin's water resources. The Task Force supports this cooperative approach and recommends that Umatilla County maintains a leadership role in promoting comprehensive, sustainable management of water resources, including the CTUIR's water rights settlement process, for all water users in the Sub-Basin.

Umatilla County Action

- **Phase III**
  - Umatilla County, by itself or through the recommended Sub-Basin water management entity, coordinate requests for Columbia River water with Westland Irrigation District
  - Request that the State of Oregon reserve a water supply out of the Columbia River that can meet the needs of the Phase III exchange, as well as the deficit reduction/groundwater replacement program
  - Lobby for state staff and financial resources to form an interagency review team to address mitigation and restoration needs of both water supplies

- **Tribal Water Rights Settlement**
  - County and CTUIR to continue on parallel paths through both planning processes, keeping lines of communication and coordination open
  - County formally participate in proposed Step III of the Federal negotiations process. Specifically:
    - Full agreement to terms by principal parties – Umatilla Basin water rights holders, Umatilla Basin irrigation districts, Umatilla Basin local governments, the CTUIR, the federal and state governments.
    - No harm to existing valid Umatilla Basin water rights holders.
    - Identification of specific CTUIR water rights and uses.
    - Incorporation of CTUIR water needs and rights into the existing Umatilla Basin Project exchanges and new similar projects, such as Phase III exchange so the use of water by CTUIR would not disrupt or harm the existing valid water uses by non-Indian irrigators, municipal water rights, and other valid water uses under Oregon water laws.

Lower Basin Industrial and Commercial Needs: Assess the non-exempt Industrial and Commercial needs and opportunities to fund the extension of infrastructure from surface water right holders, and further develop the Regional Water Supply System as a direct water supply source in the Lower Sub-Basin and/or to utilize for recharge of the basalt and alluvial aquifers.

1) Groundwater is the cheapest source of drinking water for rural development but many areas in west Umatilla County have experienced declines in groundwater quality and quantity, making some development susceptible to water problems.

2) In addition to exempt wells, some rural commercial and rural industrial development requires water supplies that exceed the threshold for exempt status. These developments require water rights but in many areas of west Umatilla County, new groundwater rights are not allowed due to the CGA designations. This has directly and indirectly impacted economic development opportunities in west Umatilla County.

3) Much of the non-resource zoned land in west Umatilla County is in close proximity to incorporated cities. West Umatilla County cities also have a great amount of land within their Urban Growth Boundaries (UGBs) that still rely on exempt wells or individual groundwater rights for water supply.

4) A jointly owned water supply system by the Port of Umatilla and the City of Hermiston, and the City of Umatilla have permitted, unperfected surface water rights out of the Columbia River.

5) The City of Umatilla has a large surface water right permit out of the Columbia River

6) The draft Water Supply and Conservation Plan for the Port of Umatilla/City of Hermiston Regional Water System identifies water available for use by the Task Force and private development within the place of use of the water rights

7) It is concluded that sufficient surface water rights exist to meet demands other than irrigation

8) The City of Hermiston states that investigations into the potential use of the Regional Water System infrastructure would need to be conducted in connection with any proposed project prior to the formation of any agreements to utilize the System for water projects identified in this plan.

9) Management and funding mechanisms could be developed to incentivize the use of the Regional Water system, provide cost share to allow both existing and new development to offset the cost of extending and utilizing

the system, and to directly fund aquifer storage and recovery and aquifer recharge projects that benefit groundwater users in the lower Sub-Basin

Umatilla County Action:

- Utilize Oregon Water Supply and Conservation Initiative and other funding sources to map areas suitable for development of regional water supply infrastructure based upon zoning, water supply shortages, water quality problems, development densities and the pl ace of use of the Port of Umatilla water right
- Assess areas that may be suitable as aquifer recharge and/or aquifer storage and recovery sites based upon infrastructure, location and other agreed upon factors
- Develop projects and monitoring/maintenance programs suitable to meet the needs of each specific project

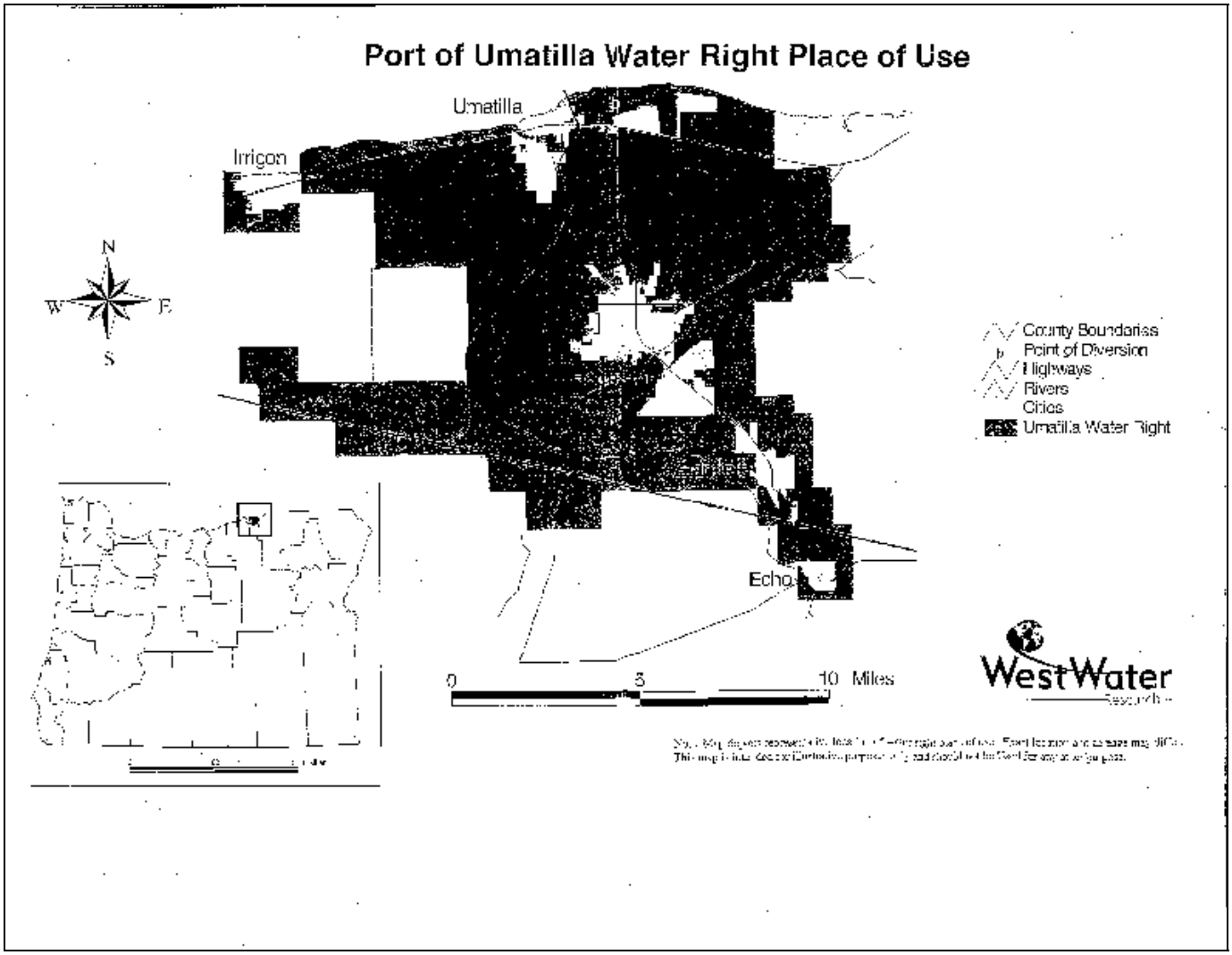


Figure 24: Place of Use of the Port of Umatilla Columbia River Right

Current Exempt Well Demands: Support continuation of the Umatilla County Exempt Well Resolution

1) Exempt domestic use groundwater wells, or as they are commonly called "domestic wells", have been given considerable attention and study.
2) Exempt wells are defined in Oregon's Revised Statutes. They are regulated, as a matter of public policy, by Oregon Statutes and Oregon Administrative Rules. In general, they do not require a permit or prior approval from OWRD. This includes exempt wells in the Subbasin's Critical Groundwater Areas.
3) Such wells are exempt from water right permitting as long as they not exceed the use set by statute. Quantities of exempt water use include domestic (household) and group home usage of up to 15,000 gallons per day, commercial uses of up to 5,000 gallons per day, livestock watering and watering of non-commercial lawn and garden areas up to ½ acre per well.
4) Internal domestic water usage for single-family dwellings is estimated at 300 gallons per day based upon the Department of Environmental Quality's Table 2, OAR 340-071-0220. Minimum onsite septic systems for a single-family dwelling must be designed to accommodate an outgoing water flow of 450 gallons per day. Total domestic well use estimates based on established sources in the Umatilla Sub-Basin are suggested at ½ acre-foot per year to 1 acre-foot per year. This variation is based in large part on the size of the well owners lawn and garden area, and whether or not they have irrigation water available from surface water sources or from one of the several surface water irrigation districts operating within the county.
5) It is estimated that there are approximately 3,909 exempt domestic wells in the Sub-Basin and 5,500 exempt domestic wells county wide.
6) Exempt domestic wells generally supply a clean, safe, and economical onsite source of water to dwellings. In instances where there are issues with water quality they can generally be corrected or remediated at a reasonable cost to the well owner.
7) Based on an estimated cost of construction of a domestic well at $5,000, the capital investment in existing wells in Umatilla County exceeds $27,500,000. At $7,500 per well this investment exceeds $41,250,000.
8) Domestic wells are spread throughout the Basin, and vary greatly in depth and aquifer type (i.e., surface/sandpoint, alluvial, and basalt). This broad and diverse spacing of the water resource base, both vertically and horizontally, provides the greatest opportunities for minimum environmental impact on aquifers and allows naturally occurring sustainability.
9) Alluvial domestic wells constructed within the soils, sands, gravels, and clays commonly run in depth from 0-feet (artesian) to depths running from 50 to 100 feet. Domestic wells in the basalt can run at depths from 50 to 400 feet.
10) Except for anecdotal comments, no specific reports, facts, or data has been provided to the Task Force regarding circumstances of domestic wells interfering with other domestic wells or interfering with permitted wells and water rights.
11) The Task Force has not been provided with documented evidence that such is occurring, generally, within the Sub Basin.
12) Intense development of domestic wells on small lots (i.e., a small resource base such as one acre or less) may have a cumulative affect in a concentrated area. In Umatilla County these occurrences are a unique exception and a result of development trends that pre-date current land use laws. The 2050 Plan is not intended or designed to

cover unique exceptions but it is generally agreed that other water supply options (such as incorporation or development of regional water supply system) could be a solution.

13) Future occurrences of domestic well interference are unlikely to occur with rural residential future zoning that is limited to minimums of 4-acre or 10-acre parcels.
14) The Task Force, after thorough research and study, recommended the findings and conclusions resulting in the County's Exempt Well Resolution BCC2005-15.
15) In the two years since the Exempt Well Resolution was adopted by the Board of Commissioners the Task Force has been presented with no evidence which would alter the findings and conclusions contained in the Resolution. It is worth noting that at no time during presentations of reports, studies, and opinions by experts was it indicated that domestic wells, due to their minimal use of water, have any statistically significant impact on Basin water supplies.

Umatilla County Action

Based upon the above the Task Force recommends that the Umatilla County Comprehensive Plan be updated to confirm the policy and order of the Exempt Resolution BCC2005-15 which states as follows:

> "In so far as the county is required to adopt findings to approve land use permits, the county will rely on this document to defend the assumption that new exempt wells do not make a significant adverse impact on the groundwater resources. The county will assume exempt wells are appropriate and permissible"

The Task Force is aware that legislative changes, or administrative rule changes by OWRD, may expand or limit exempt wells whether by permitting requirements or use and quantity requirements. The Task Force recognizes that future parcel size minimums in the County, whether 4-acre rural residential or 10-acre rural residential, constitutes as adequate resource base for meeting the carrying capacity in the Umatilla Sub-Basin.

Pending the development of other management alternatives encompassed by this plan the Task Force recommends no further Basin or County level management of Exempt/Domestic Wells and shall rely on State Statutes and Administrative Rules as well as OWRD for further regulation, if any, of Exempt/Domestic Wells.

Water Policy and Regulation

The 2050 Plan can be summarized by a series of actions that need to be completed to (1) restore water supplies and recover aquifers in the lower Sub-Basin, (2) assess water supplies available for future uses and (3) establish policy(ies) for distributing the water supplies identified to all of the land uses that may depend on those supplies in the future.

Due to the fact that these actions are complex, costly and will occur over a long period of time, updates to water policies and regulations are recommended to (1) assure that projects are developed to meet intended benefits, (2) assure that protections are in place

while necessary studies and water rights assessments are completed, and (3) provide an avenue for policy(ies) and regulations to be updated once the necessary data and other legal needs are obtained.

Additionally, the Task Force understands that efforts are being taken at the state, county and municipal level to clarify rights and responsibilities relating to water planning and regulation. Since these efforts are not completed the Task Force has not addressed and will not recommend any alternatives related to this effort other than to support a thorough review of these rights and responsibilities, and future clarification regarding jurisdiction and obligations.

Why Necessary for Groundwater Recovery

The necessary scientific information to establish groundwater availability and the hydrologic interaction between groundwater and surface water in the Umatilla Basin is still not available. Without adequate scientific information to establish groundwater availability and hydrologic interactions between groundwater and surface water, OWRD cannot determine how much groundwater is currently available for future appropriation in the Umatilla Basin and/or how much groundwater development will result in basalt groundwater declines.

OWRD has stated that groundwater investigations conducted in the early 1980s suggested that groundwater throughout the basin was already overdrafted at that time. Additionally, OWRD states that interference between surface water supplies and rights as a result of groundwater pumping is a significant issue in the basin.[26] Without an estimate of the availability of groundwater and surface water resources, it is difficult to plan for the gradual recovery of Sub-Basin aquifers or establish parameters on future use to limit interference and degradation of ground and surface water sources.

The CTUIR is currently working with the U.S. Department of Interior to quantify their consumptive and non-consumptive water rights in the Umatilla Basin. Quantification of CTUIR water rights will establish a senior CTUIR water right in the Umatilla Basin that is not currently assessed by OWRD when issuing new ground and surface water rights.

Until the CTUIR water rights are settled and the adequate scientific information is in place to establish a water budget in the Umatilla Basin we cannot estimate the availability of groundwater and surface water resources in the Umatilla Sub-Basin.

Recommended Management Options

Regulatory Updates: County petition the state to form a Rules Advisory Committee to update the Umatilla Basin Rules to limit certain the Alluvial and Basalt aquifers for and develop rules to govern the use of water permits issued for groundwater replacement

Implementing tighter restrictions as a management tool while conducting necessary studies and negotiations has kept Umatilla Sub-Basin surface water right holders relatively whole, and prevented additional over-appropriation of the surface water resources.

The management tool utilized in the past surface water management efforts was a full blown withdrawal of the surface water resources which precluded the issuance of new water right permits. The following is a summary of the purpose and results of the withdrawal Order:

1) On September 24, 1985 the Umatilla Basin Groundwater Task Force adopted a resolution requesting that the Umatilla River and its tributaries be withdrawn from further appropriation with exceptions granted to groundwater replacement and fish migration.

2) On December 2, 1985 the OWC withdrew the Umatilla Basin and tributaries based on the following:

- The OWC withdrew the unappropriated waters of the Umatilla River and its tributaries between June 1 and October 31 of each year because there was little or no unappropriated flow during that time period.
- The OWC also withdrew the Umatilla River and its tributaries from further appropriation between November 1 and May 31.

3) This withdrawal order was to sunset on December 31, 1988 and was intended to allow the 1986 Task Force to complete their study and report and give time for additional Umatilla Basin Exchange discussions.

4) The WRC rescinded the Nov. 1 – May 31 surface water withdrawal following adoption of the Umatilla Basin Rules which classified water sources for specific uses.

5) The withdrawal orders were a good management tool in the Umatilla Basin to allow study and planning without the threat of further appropriation and/or over-appropriation of remaining surface water resources (i.e. the withdrawal minimized the threat of a moving water right target).

6) The withdrawal allowed the stakeholders of previous planning efforts to examine the unappropriated surface water supplies remaining in the Umatilla Basin (including necessary fish flows) and classify those uses based on consensus.

2050 Plan Goals Addressed

1 sustainability, 3 local control, 5 water budget, 6 current and future needs, 7 projects and funding and 9 consensus

COC Review Results

There is strong support among those that participated for obtaining essential information needed to understand how the groundwater system works, especially the interrelationship between surface water and groundwater. It is generally felt that there is no choice but to curtail new appropriations until "we better understand who's having problems and why." This view is held by two-thirds of questionnaire respondents.

Strongly disagree	3.8%
Disagree	10.6%
No opinion	18.3%
Agree	23.1%
Strongly agree	44.2%

Among the few concerns expressed by interviewees is that the nature and timing of the studies are undefined and that it is OWRD's responsibility, not the County's, to manage water rights. OWRD interprets this management strategy as the development of interim basin rules to restrict further ground water development while studies are being conducted and notes that this restriction could be in place for an extended period of time, considering how much time it may take to raise funding and complete these studies. The agency also points out that there may be insufficient data to implement these steps on a basin-wide scale, even as an interim measure.

For these reasons, the Task Force has recommended that the County and the MOA process define a specific scope for development of both the Umatilla Basin Rule updates and to develop a set of rules to be utilized for implementation of the deficit reduction/replacement water program.

County Action

Umatilla Basin Rule Update

- Request the formation of a Rules Advisory Committee to amend the Umatilla Basin Rules (proposed amendments recommended by the Task Force are found in Appendix B) to protect basin wide basalt and alluvial aquifers from over-development.
- The RAC is to develop rules that govern new appropriations until the CTUIR water rights assessment is completed and necessary

groundwater characterization and optimization studies have been conducted.

- Recommend that the RAC establish thresholds for allowing limited water appropriations during the temporary withdrawal which could include exempt uses, supplemental water rights
- Assure that funds are provided to speed up the process of obtaining the necessary studies to understand groundwater/surface water interaction, and groundwater availability.
- Rescind, or update exemptions for withdrawal following studies, CTUIR water rights quantification and update to the Umatilla Basin Rules.

Development of Groundwater Replacement and Water Brokerage Rules

Step #1: Replacement Water Rules

- County request state staff and resource assistance to develop rules that govern the deficit reduction/replacement water program
- Rules need to address the seniority of current groundwater right holders under the prior appropriation doctrine
- Rules need to assure that replacement water will go to existing water rights within the designated Critical Groundwater Areas
- Once the water is allocated to current water right holders, the Brokerage System can be instituted

Step #2: Development of a Water Brokerage System

- Request state staff and resource assistance to develop rules to govern the brokerage and marketing of replacement water
- Brokerage system shall be designed to reward efficiency and maximize the options for water users to sell, lease or use some or all of their water right duty
- Brokerage system shall address issues associated with enlargement if a water user is maximizing the use of a rate and duty originally associated with a groundwater right
- Brokerage system shall be designed to be administered by the proposed governmental entity or special district

Continue to recommend state agencies clarify their responsibility and jurisdictions, in consultation with cities and counties to better coordinate land use and water supply, as well as the relevant regulations.

As stated above, the Task Force understands that efforts are being taken at the state, county and municipal level to clarify rights and responsibilities relating to water planning and regulation. Since these efforts are not completed the Task Force has not addressed and will not recommend any alternatives related to this effort other than to support a thorough review of these rights and responsibilities, and future clarification regarding jurisdiction and obligations.

In addition to the statements above, OWRD and DLCD have provided comments regarding Umatilla County options to address water supply and carrying capacity (letter included as part of Appendix R). These comments list additional options that Umatilla County could pursue under land use law.

County Action

1) Board of Commissioners work through AOC to assess the effectiveness of the State Agency Coordination program, especially as it relates to surface and groundwater quantity and quality
2) Board of Commissioners and Planning Commission coordinate with DLCD and OWRD on a work plan to update the Umatilla County Comprehensive Plan including but not limited to updates to Chapter VIII (Goal 5)
3) Develop clear and objective land use standards, following comprehensive plan updates to insure land use approval is in compliance with and meets the carrying capacity guideline for water supply

6-3 Development of a Water Budget (Quantifying Water Availability)

Scientific Needs
The current water management structure lacks the availability of 21st century scientific data, especially as it relates to groundwater development and management.

The surface water quality and quantity of the Sub-Basin has been studied for many years due to the Umatilla Basin Project, Umatilla Basin Exchange Project, the Umatilla River TMDL and LUBGWMA planning processes, and various water development and fishery projects.

According to OWRD, statutes require that groundwater be managed as a renewable resource.[27] There is readily available information to make technically defensible decisions regarding the development, use and protection of surface water resources as a renewable resource. There is a lack of readily available data to enable managers to make technically defensible decisions regarding alluvial and basalt groundwater development, interference, use and protection which is required before OWRD can meet their goal to manage the resource as renewable.

Why Necessary for Groundwater Recovery

The necessary scientific information to establish groundwater availability and the hydrologic interaction between groundwater and surface water in the Umatilla Basin is still not available. Without adequate scientific information to establish groundwater availability and hydrologic interactions between groundwater and surface water, OWRD cannot determine how much groundwater is currently available for future appropriation in the Umatilla Basin and/or how much groundwater development will result in basalt groundwater declines.

Some areas of the county may only be able to meet the gradual recovery goal if groundwater recharge projects were to be implemented. It is important to understand the location of these areas so that projects can be prioritized and implemented.

This science is necessary to assure that land use decisions and land use planning takes into account the carrying capacity of the land and natural resource base prior to making decisions regarding development that requires large water supplies

Lastly, it is important to understand if groundwater water quantity can directly benefit water quality by both increasing return flows to Sub-Basin streams and diluting out nitrogen and other contaminants in Sub-Basin aquifers.

2050 Plan Goals Addressed

1 sustainability, 4 surface and groundwater connection, 5 water budget, 6 current and future needs and 7 projects and funding

Recommendations

Monitoring the Benefits of Groundwater Replacement: Pursue enlargement and coordination of synoptic sampling of groundwater quantity and quality in the Umatilla Basin

Since 1979 OWRD has been conducting annual water level monitoring in the Sub-Basin. OWRD utilizes a network of over 275 wells in the Sub-Basin, most of them located within one of the four critical groundwater areas. In addition to the OWRD monitoring network, DEQ maintains an extensive monitoring network to analyze the effectiveness of the LUBGWMA action plan (see figure 25 for the relationship between the LUBGWMA boundaries and CGSs). During the 15 month reconnaissance effort to establish the LUBGWMA action plan DEQ sampled 198 wells and complete synoptic sampling of over 100 wells on an annual basis to track listed contaminants. These two monitoring processes are valuable tools and can be utilized to analyze the effectiveness of water supply projects associated with this plan. These two sampling events could be more successful if adequate measures were in place to coordinate the review of the results for both water quality and quantity.

Umatilla County Action

Work with the Governor's Office and respective departments to pursue an integrated monitoring network that analyzes and relates the benefits/impacts on water quantity and quality as a result of implementation of this plan. Lobby for these departments to receive additional funding to enlarge the monitoring network in conjunction with the pilot project work that is being completed through SB 1069.

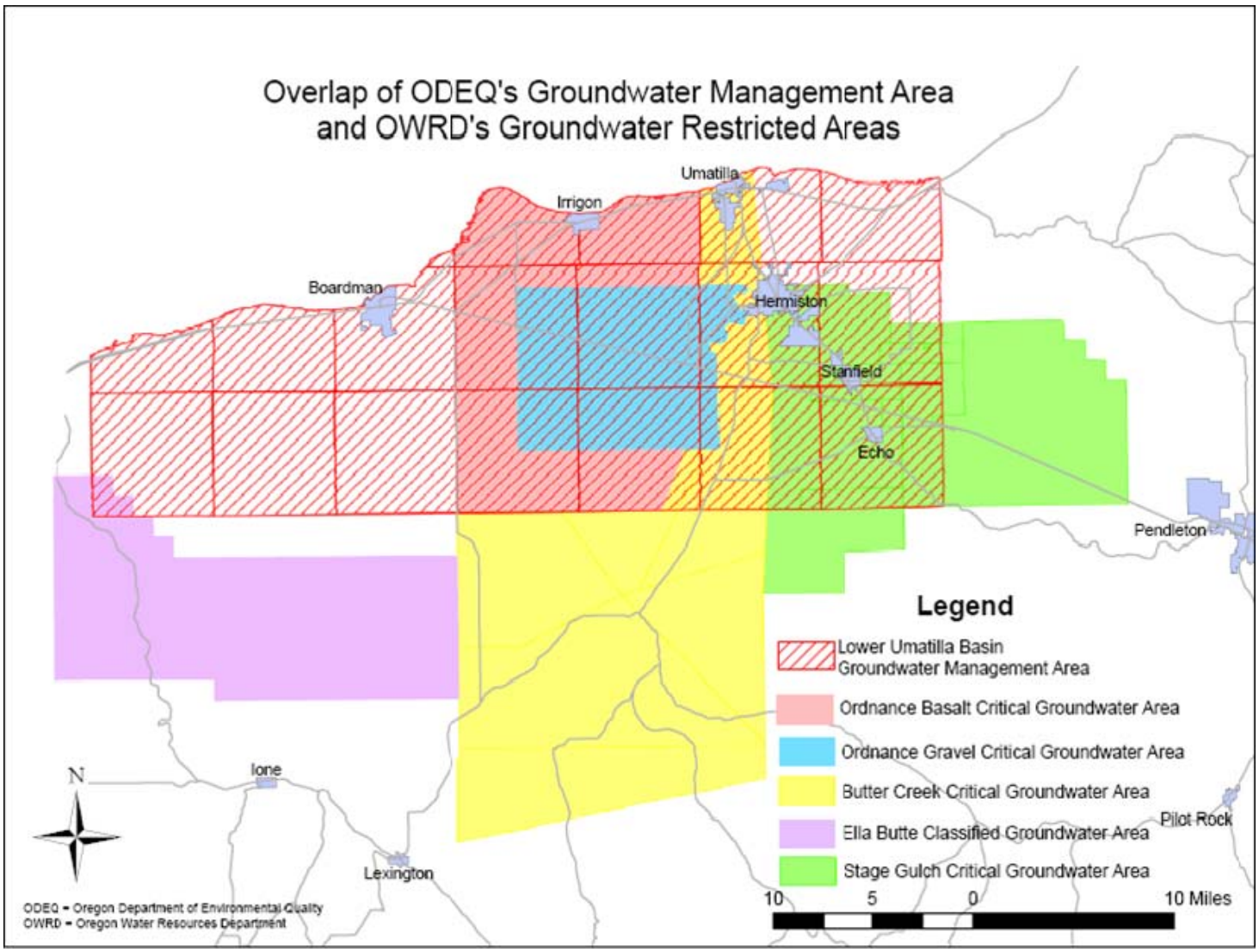


Figure 25: Relationship between the DEQ administered Lower Umatilla Basin Groundwater Management Area and the Four State Designated Critical Groundwater Areas designated by OWRD

Water System Characterization: Complete a Sub-Basin wide groundwater characterization model of the alluvial and basalt aquifers. The groundwater characterization effort shall include optimization modeling (analysis of the short and long-term effects of various water management alternatives). If funding is not available to complete the full study, implementation measures should be prioritized according to most critical area with highest economic return in relation to cost of the study.

Groundwater information is lacking in the following areas:

- Aquifer co-mingling and effects of open bore holes in basalt aquifers
- Hydrologic connectivity between the various alluvial aquifers and streams of the Umatilla River Watershed
- Basalt connectivity between lower and upper basin uses
- Basalt aquifer compartmentalization (see figure 26 relating to the issues with aquifer compartmentalization)
- Sustainable basalt aquifer development
- Protection for existing groundwater rights from the effects of new basalt aquifer development
- Sustainability of the basalt and alluvial groundwater resource
- Natural and artificial recharge necessary to begin the "gradual recovery" management option
- Umatilla Basin Water Budget
- Water available for use out of the Columbia River

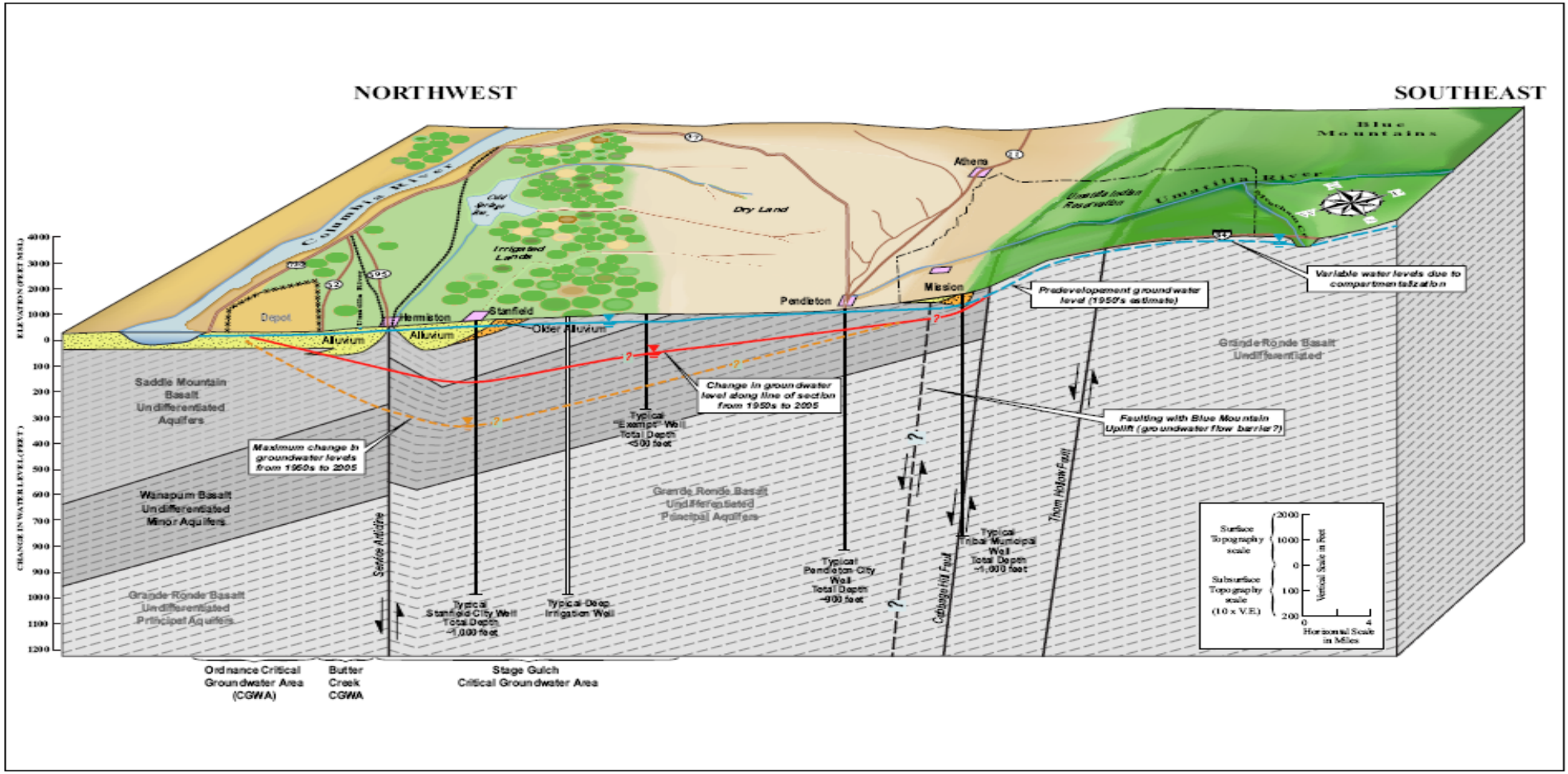


Figure 26: Graphic representation of the Umatilla Groundwater Structural Basin (OSU/IWW). Note that the current picture reflects that the basalt groundwater system is interconnected like a bath tub. Further research is necessary to accurately depict the compartmentalization and interconnectivity of the basalt groundwater resource.

Umatilla County Action

- Coordinate with OWRD on the findings of their audit of the 1988 USGS transient model to test predictive ability of aquifer response and instream-flow rates with climate, continued groundwater development, changes in irrigation practices and UBP exchanges (1988 model included as Appendix O).
    - As an example, do open boreholes across multiple aquifers significantly affect flux between aquifers?
- Test compartmentalization of aquifers versus a "bathtub" conceptual model with/without bottlenecks to flow.
    - As an example, in terms of management, does compartmentalization of aquifers matter and can compartments be measured and managed?
- Conduct a workshop with Hanford hydrogeologists and Oregon/Washington hydrogeologists to share understanding of basalt behavior to pumping and other stresses like irrigation application, fault and fold boundaries, etc.
- Long-term aquifer tests with monitoring of specific basalt aquifers and across fault and fold boundaries
- Drill/construct piezometers for aquifer testing, quantification of flow in specific aquifers, and long-term monitoring of water levels in basalt aquifers
- Drill deep boreholes to determine depth of usable groundwater, characterize aquifers with depth, age of water in aquifers, depth to basement
- Seepage runs by season (measure inflows and outflows to river reaches)
- Comparison of aquifer response to climate and gaging records
- Verify previous age dating of aquifers and expand sample area to test aquifers
- Model the transport rate of nitrate from the alluvial to basalt aquifers
- Evaluate and compare the cost of developing aquifer storage and recovery to the cost of building off-stream impoundments and conveyance infrastructure for future water development and use

Encourage the State of Oregon to work with Columbia River stakeholders to complete a Columbia River Water Management Plan for the State of Oregon, (i.e. how Oregon will use Columbia River Water). The Columbia River Water Management Plan shall assess water availability and use.

Out of the 18 western states, Oregon and Alaska are the only two that do not have comprehensive water plans

1) Washington, Idaho and Montana all have water supply plans, which include management plans for the Columbia River
2) The State of Washington recently passed the Columbia River Water Supply Act of 2006 which is intended to provide a reliable supply of water for existing interruptible water rights and for new uses, including consumptive use and aquatic needs.[28]
3) The State of Washington has completed an assessment of known and anticipated water demands for all consumptive and non-consumptive uses

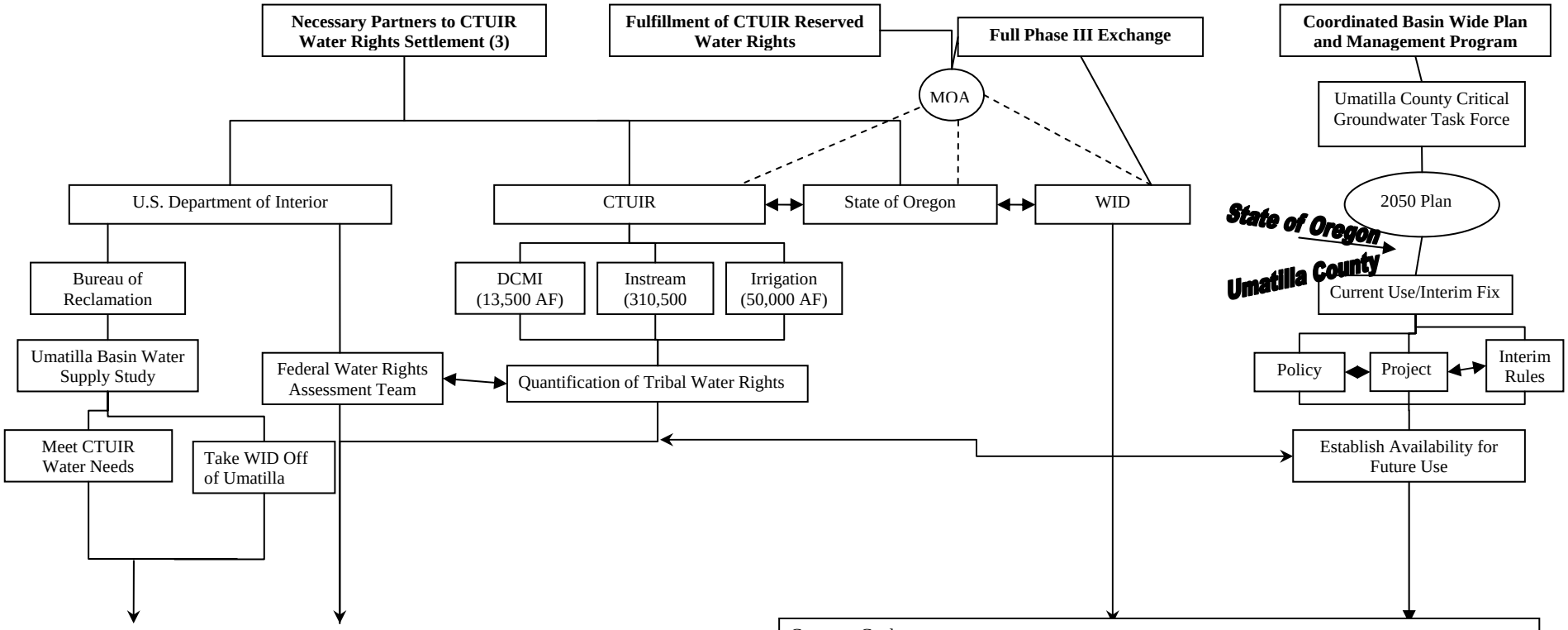
along the Columbia River and continue to plan to meet those demands in a comprehensive manner.[29]

4) The Columbia Basin Program (OAR 690, 519) and the public interest review standards (OAR 690, 033) could be utilized to establish a long-term plan for Columbia River water supplies utilized in Oregon or protected in-stream through Oregon.
5) Senate Bill 602, sponsored by Senator David Nelson, was introduced during the 2007 Regular Session of the Oregon State Legislature to develop a similar Columbia River Water Resources Management Plan.
6) Senate Bill 602 stated that "[a] key priority of water resources management in the Columbia River Basin is the development of new water supplies that include storage and conservation in order to meet the economic and community development needs of people and the in-stream flow needs of fish."[30] (See Appendix I for full text of measure SB 602).
7) Senate Bill 602 did not pass in 2007 but is still necessary to identify anticipated Columbia River water demands, and the opportunities to meet the demands through storage, development, conservation, restoration, etc.
8) The passage of legislation such as SB 602 could insure a sustainable supply of water for groundwater replacement in the Sub-Basin and help Umatilla County assess Columbia River water availability to meet future needs.
9) Since the Columbia River supports the statewide economy, investment by the State of Oregon to ensure a comprehensive approach to Columbia River management is warranted.

Umatilla County Action

- Lobby the State of Oregon to pass Oregon State Legislation similar to SB 602 that was proposed by Senator David Nelson in 2007
- Request that funds be directed to a study of the State of Washington's Columbia River Water Supply Act of 2006, also known as the Columbia River Basin Water Management Program and as the Columbia River Basin Water Supply Development Program
- Umatilla County shall work with AOC to assure that a model is developed to create a balanced, comprehensive approach towards the unique in-stream and out of stream opportunities the Columbia River system provides

6-4 Long-Range Water Management Outlook



Desired Outcomes

- Fulfillment of CTUIR Reserved Indian Rights
- No Harm/Fulfillment of Existing Water Rights and Uses
- WID off of River via Phase III or by Other means determined by Supply Study
- Assured, Long-Term Water Supply
- Replenishment of Groundwater Resources for Future Needs

Common Goals

- Best Case Scenario: Col. River Water Use Classifications
- Updated and Coordinated Basin Rules
- Capacity Optimization Through Coordination and Formal Agreement
- Infrastructure Development/Plan with dedicated financial base
  - Includes Restoration/Mitigation Bank
  - Includes contributions from all water impacts, including exempt wells
    - Funds O&M, Debt or Federal Match Obligation, and Monitoring and Maintenance of Water Supply and Water Supply Plans

ACRONYMS

AOC – Association of Oregon Counties

BoR – United States Bureau of Reclamation

CGA – Critical Groundwater Area

CTUIR – Confederated Tribes of the Umatilla Indian Reservation

CTUIR BOT – CTUIR Board of Trustees

CTUIR EPRP – CTUIR Environmental Planning and Rights Protection Program

CTUIR TWC – CTUIR Tribal Water Commission

DAS – Oregon Department of Administrative Services

DEQ – Oregon Department of Environmental Quality

DHS – Oregon Department of Human Services

DLCD – Oregon Department of Land Conservation and Development

GERT – Oregon Governor's Economic Revitalization Team

LOC – League of Oregon Cities

MOA – Memorandum of Agreement

MOU – Memorandum of Understanding

N/A – Not Applicable

NOAA NMFS – National Oceanic and Atmospheric Administration, National Marine Fisheries Service

NWPPCC – Northwest Power Planning and Conservation Council

OAR – Oregon Administrative Rules

OECDD – Oregon Economic and Community Development Department

OIA – Oregonians in Action

ODA- Oregon Department of Agriculture

ODF&W – Oregon Department of Fish and Wildlife

ORS – Oregon Revised Statutes

OWRC – Oregon Water Resources Congress

OWRD – Oregon Water Resources Department

SAC – Oregon State Agency Coordination Program

SWCD – Umatilla County Soil and Water Conservation District

UBWC – Umatilla Basin Watershed Council

USACE – United States Army Corps of Engineers

USDA – United States Department of Agriculture

USGS – United States Geological Survey

USFWS – United States Fish and Wildlife Service

WRC – Oregon Water Resources Commission

GLOSSARY AND DEFINITIONS

The Task Force utilized a variety of sources to develop a definition section that suits the needs of the Sub-Basin. In total, seven references have been included in this section to reflect the understanding of the Task Force and the meaning to each term that should be utilized in this planning document.

References:

(1) Oregon Water Resources Department (Administrative Rules or 2003 handout called Ground Water Supplies in the Umatilla Basin)
(2) Confederated Tribes of the Umatilla Indian Reservation Water Code
(3) US Geological Survey (Water Science Glossary of Terms)
(4) The Groundwater Foundation
(5) The American Heritage® Dictionary of the English Language, Fourth Edition
(6) Oregon Department of Land Conservation and Development (Revised Statute or Administrative Rules)
(7) Umatilla County

Allocation: Volume of water entitlement to the holder of a water right.
"Allocate" means to determine allowable new uses by classifying waters through basin program rules, withdrawing waters, reserving water for future economic development by order, or issuing water rights for waters of the state. (1)

Alluvium
Deposits of clay, silt, sand, gravel, or other particulate material that has been deposited by a stream or other body of running water in a streambed, on a flood plain, on a delta, or at the base of a mountain. (3)

Appropriation Doctrine
The system for allocating water to private individuals used in most Western states. The doctrine of Prior Appropriation was in common use throughout the arid west as early settlers and miners began to develop the land. The prior appropriation doctrine is based on the concept of "First in Time, First in Right." The first person to take a quantity of water and put it to Beneficial Use has a higher priority of right than a subsequent user. Under drought conditions, higher priority users are satisfied before junior users receive water. Appropriative rights can be lost through nonuse; they can also be sold or transferred apart from the land. (3)

Aquifer
A geologic formation(s) that is water bearing. A geological formation or structure that stores and/or transmits water, such as to wells and springs. Use of the term is usually restricted to those water-bearing formations capable of yielding water in sufficient quantity to constitute a usable supply for people's uses. (3)

Aquifer (Alluvial)

An aquifer with intergranual porosity (groundwater that fills the pore spaces (voids) between the silt, sand, and gravel particles that make up the alluvial deposits). Alluvial deposits can be made of up of as much as 30 or 35% pore space. (1)

Aquifer (Basalt)
An aquifer with interflow-zone porosity (groundwater that fills the pore space between the top of one basalt flow and the bottom of an overlying basalt flow. The space between flows is generally limited to thin zones of broken or fractured rock at the top or base of the individual basalt flows. The dense interiors of flows are relatively impermeable and confine groundwater to discrete tabular aquifers. The shallow basalt aquifers are hydraulically connected to the alluvial aquifer, the Umatilla River and Columbia River where the interflow zones are exposed beneath the alluvial aquifer and in the beds of the rivers. (1)

Aquifer (Unconfined)
An aquifer whose upper water surface (water table) is at atmospheric pressure, and thus is able to rise and fall. (3)

"Unconfined Aquifer": means an aquifer in which the hydrostatic head at the upper surface of the ground water is atmospheric. (1)

Aquifer (Confined)
Soil or rock below the land surface that is saturated with water. There are layers of impermeable material both above and below it and it is under pressure so that when the aquifer is penetrated by a well, the water will rise above the top of the aquifer. (3)

"Confined Aquifer": means an aquifer in which ground water is under sufficient hydrostatic head to rise above the bottom of the overlying confining bed, whether or not the water rises above land surface. (1)

Basalt Flows
Lava flows composed of basalt that erupted from fissures in the earth's crust in eastern Oregon, Washington and Idaho. These lava flows spread out over vast areas, some flowing as far west as the Pacific Ocean. Over time, scores of eruptions occurred resulting in basalt layers stacked on top of another. The rocks formed by these eruptions are collectively called the Columbia River Basalts and form the dominant rock units in the Umatilla Basin. (1)

Base flow
Streamflow coming from groundwater seepage into a stream or river. Groundwater flows underground until the water table intersects the land surface and the flowing water becomes surface water in the form of springs, streams/rivers, lakes and wetlands. Baseflow is the continual contribution of groundwater to rivers and is an important source of flow between rainstorms. (4)

Basin Program

A program adopted by the Water Resources Commission to establish water management policies and objectives for a specified basin. Basin programs establish rules for appropriation and use of surface and ground water within each river basin. Water use regulations include classification of surface and ground waters according to permitted uses, the withdrawal or surface and ground waters from further appropriation, the reservation of waters for specific future uses, and the establishment of minimum perennial streamflow requirements. (1)

Beneficial Use
Reasonably efficient use of water without waste for a purpose consistent with the laws and the best interests of the people of the state. (1)

"Beneficial Use" means an instream public use or a use of water for the benefit of an appropriator for a purpose consistent with the laws and the economic and general welfare of the people of the state and includes, but is not limited to, domestic, fish life, industrial, irrigation, mining, municipal, pollution abatement, power development, recreation, stockwater and wildlife uses. (1)

The purpose or benefit to be derived from any groundwater or surface water body or the diversion of water, as designated by the Confederated Tribes, whether or not it is currently being attained. Beneficial uses include domestic, community, municipal, public, agricultural irrigation, stock watering, general farm, commercial, industrial, fire protection, cultural, mining, fish and aquatic life habitat, wildlife habitat, pollution abatement, recreation, power generation, and fish hatcheries. (2)

Carrying capacity
Level of use which can be accommodated and continued without irreversible impairement of natural resources productivity, the ecosystem and the quality of air, land and water resources. (6)

Alternative 1: "Capacity of the Resource" means the ability of a surface water or groundwater resource to sustain a balance of public and private uses without causing over-appropriation or otherwise significantly impairing the function or character of the resource. (1)

Coordinating Governments
Entities required to assure that the needs of all levels of government, semipublic and private agencies and the citizens of the State of Oregon have been considered and accommodated as much as possible. (6)

Conserve
To manage in a manner which avoids wasteful or destructive uses and provides for future availability (6)

Conservation
The reduction of the amount of water diverted to satisfy an existing beneficial use achieved either by improving the technology or method for diverting, transporting,

applying or recovering the water or by implementing other approved conservation measures. (1)

The act of conserving the environment (6).

Conserved Water
The amount of water that results from conservation measures, measured as the difference between: (a) The smaller of the amount stated on the water right or the maximum amount of water that can be diverted using the existing facilities; and (b) The amount of water needed after implementation of conservation measures to meet the beneficial use under the water right certificate. (1)

Conservation and Efficient Water Use Policy (OWRD)
The elimination of waste and improving the efficiency of water use are high priorities. Use of water without waste is required by state statute and the prior appropriation doctrine. Programs to eliminate waste shall be implemented. In addition, improving the efficiency of water use through implementation of voluntary conservation measures can help restores instream flows and provide for future needs including public uses and continued economic development. Priority shall be given to developing subbasin conservation plans and providing public assistance in areas of known over-appropriation of surface water and groundwater and of water quality problems. (1)

Critical Groundwater Area-OWRD and Land use Goal 5
"Critical Ground Water Area Boundary" means a line established in a critical ground water area order on a map that surrounds an area in which one or more of the statutory criteria for critical area declaration are met and which is located either: (a) Physically by coincidence with natural features such as ground water reservoir boundaries, hydrologic barriers, or recharge or discharge boundaries; or (b) Administratively by surrounding an affected area when that area does not coincide with an area bounded by natural features. (1)

Critical Groundwater Taskforce
The Task Force is made up of a wide array of diverse citizens from through out Umatilla County whom have an intense interest in sustainable development. The Task Force consists of a body of voting members, each appointed by the Umatilla County Board of Commissioners for indeterminate terms. These members serve without pay and are responsible for conducting affairs, as appropriate, to achieve the purposes specified in the statement of Task Force objectives which include:

1. Review and evaluate previous studies, plans and actions taken.
2. Gather, organize and analyze available information.
3. Inventory anticipated needs through year 2050.
4. Develop a consensus for a sustainable plan, that is technically and economically feasible, to protect and enhance groundwater quantity, as an essential natural resource.
5. Coordinate with entities working simultaneously on plant to protect groundwater quality.

6. Develop lines of communication and coordination to reduce obstacles and to broaden the base of support.
7. The Task Force may develop and advance such other consensus objectives as it determines.
8. Identify and promote development of projects with known multi-beneficial use. (7)

Discharge
The volume of water that passes a given location within a given period of time. Usually expressed in cubic feet per second. (3)

Doable
Achievable within reason.

Discharge area: The area or zone where groundwater emerges from the aquifer. The outflow maybe into a stream, lake, spring, wetland, etc. (4)

Drainage Basin--land area where precipitation runs off into streams, rivers, lakes, and reservoirs. It is a land feature that can be identified by tracing a line along the highest elevations between two areas on a map, often a ridge. Large drainage basins, like the area that drains into the [Umatilla River] contain many smaller drainage basins. Also called a "watershed." (3)

Exempt Uses
Uses of water for which no registration, certificate of registration, application for a permit, permit, certificate of completion of water right certificate is required. (1)

Federal Reserve Water Rights
The right for a quantity of water necessary to satisfy the primary purpose or purposes of lands set aside by the United States government as a federal reservation, or a right derived from such rights. The reservation shall be documented in an original Congressional Act, Presidential Order, Indian Treaty, or Court Order. (1)

Groundwater
(A) Water that flows or seeps downward and saturates soil or rock, supplying springs and wells. The upper surface of the saturate zone is called the water table. (B) Water stored underground in rock crevices and in the pores of geologic materials that make up the Earth's crust. (3)

Groundwater Management
Policy -- The groundwaters of the State of Oregon belong to the public. The reasonable control, protection, and use of groundwater is governed by the state on behalf of the public. Groundwater shall be managed to promote efficient and sustainable use for multiple purposes. Groundwater overdraft and contamination shall be prevented to avoid health hazards, environmental damage, and costly correction programs. Interference between groundwater uses and competing groundwater and surface water uses shall be prevented and/or controlled to protect the water resource and existing rights. The state shall pursue restoration of contaminated groundwaters to protect present and future uses.

Coordinated action by federal, state and local agencies, Indian tribes, and special districts, along with public education, shall be fostered to promote the effective management, protection and beneficial use of groundwater.

Groundwater Recharge
Water added to an aquifer; for example, when rainwater seeps into the ground. Recharge may occur artificially through injection wells or by spreading water over groundwater reservoirs. (4)

Inflow of water to a groundwater reservoir from the surface. Infiltration of precipitation and its movement to the water table is one form of natural recharge. Also, the volume of water added by this process. (3)

Groundwater and Surface Water Interaction
Shallow alluvial aquifers (unconfined) interact closely with streams, sometimes flowing (discharging) water into a stream or lake and sometimes receiving water from the stream or lake. An aquifer that feeds streams is said to provide the stream's baseflow. (This is called a gaining stream.) In this way, groundwater discharge is responsible for maintaining the hydrologic balance of surface streams, springs, lakes, wetlands and marshes. The source of groundwater (recharge) is through precipitation or surface water that percolates downward. Depending on climate, land use, soil type, geology and many other factors, a percentage of annual precipitation results in groundwater recharge, and as part of the water cycle, a percentage of groundwater recharge goes to support streamflow.

Hydraulic Connection
Water can move between a surface water source and an adjacent aquifer. (1)

Hydrologic Cycle
The general pattern of water movement by evaporation from sea to atmosphere, by precipitation onto land, and by return to sea under influence of gravity. (1)

The cyclic transfer of water vapor from the Earth's surface via evapotranspiration into the atmosphere, from the atmosphere via precipitation back to earth, and through runoff into streams, rivers, and lakes, and ultimately into the oceans. (3)

The cycle of evaporation and condensation that controls the distribution of the earth's water as it evaporates from bodies of water, condenses, precipitates, and returns to those bodies of water. Also called water cycle. (5)

Natural Resources
Air, land and water and the elements thereof which are valued for their existing and potential usefulness to man. (6)

Overdraft (overdraw)
To artificially produce water, in any one year period, from a groundwater reservoir, or part thereof, at an annual rate that:
(a) Exceeds the average annual recharge to that ground water supply over the period of record; or,

(b) Reduces surface water availability resulting in: (A) One or more senior appropriators being unable to use either their permitted or customary quantity of surface water, whichever is less; or (B) Failure to satisfy an adopted minimum streamflow or instream water right with an effective date senior to the causative ground water appropriation(s).
(c) Reduces the availability of surface waters that have been: (A) Withdrawn with an effective date senior to the priority dates of the causative ground water appropriations; or (B) Restrictively classified with an effective date senior to the priority date(s) of the causative ground water appropriations. (1)

Management
The act, art, or manner of managing, handling, controlling, directing, etc. (5)

Planning Area
The air, land and water resources within the jurisdiction of a governmental agency. (6)

Planning
Planning – to devise a scheme for doing, making, or arranging. (5)

Preserve
To save from change or loss and reserve for a special purpose. (6)

Protect
Save or shield from loss, destruction, or injury or for future intended use. (6)

Public Facilities and Services
Projects, activities and facilities which the planning agency determines to be necessary for the public health, safety and welfare. (6)

Public Gain
The net gain from combined economic, social and environmental effects which accrue to the public because of a use or activity and its subsequent resulting effects. (6)

Regional problem solving program
A collaborative regional problem-solving process is a planning process directed toward resolution of land use problems in a region. The process must offer an opportunity to participate with appropriate state agencies and all local governments within the region affected by the problems that are the subject of the problem-solving process. The process must include:
(a) An opportunity for involvement by other stakeholders with an interest in the problem; and
(b) Efforts among the collaborators to agree on goals, objectives and measures of success for steps undertaken to implement the process.

"region" means an area of one or more counties, together with the cities within the county, counties, or affected portion of the county. (6)

Reasonably Stable Water Level

Annual static water level decline of less than one foot over the entire [Critical Groundwater Area] subarea as determined by averaging the annual water level change of the representative wells in the subarea, and the water level change for the subarea averaged over five consecutive years displays no decline. (1)

Restore

Revitalizing, returning, or replacing original attributes and amenities, such as natural biological productivity, aesthetic and cultural resources, which have been dimished or lost by past alterations, activities, or catastrophic events. (6)

Safe Yield
The annual amount of water that can be taken from a source of supply over a period of years without depleting that source beyond its ability to be replenished naturally in "wet years." (4)

Social Consequences
The tangible and intangible effects upon people and their relationships with the community in which they live resulting from a particular action or decision. (6)

State Agency Coordination program.
A program required by the Oregon Land Conservation and Development Department to assure that State Agency rules and programs which affect land use comply with the Statewide Planning Goals and are compatible with acknowledged City and County Comprehensive Plans. (6)

Stakeholders One who has a share or an interest, as in an enterprise (5)

Sustainability
In general, groundwater sustainability is the development of and use of groundwater in a manner that can be maintained for an indefinite time without causing unacceptable environmental, economic, or social consequences. (3)

Sustainable Annual Yield
The volume of water that can be pumped on an annual basis while maintaining reasonably stable water levels. This is a measurement of the capacity of the resource. (1)

Umatilla Project
Bureau of Reclamation's water storage and conveyance project for irrigation purposes in the Umatilla Basin. The project was started about 1905 and consists of Cold Springs Reservoir, McKay Reservoir, diversion dams in the Umatilla River that divert water from the Umatilla River, canal systems and other infrastructure for delivering live flow and stored water to four irrigation districts and numerous individual contract water rights holders in the Umatilla Sub-Basin.

Umatilla Basin project

Umatilla Basin Project - a consensus-based solution that was developed by the Confederated Tribes of the Umatilla Indian Reservation, irrigation districts in the Umatilla Basin, U.S. Bureau of Reclamation, the state of Oregon, Bonneville Power Administration, and others, and that was authorized and funded by the U.S. Congress in 1988, to provide water for instream flow to restore the salmon fishery to the Umatilla River and to maintain the existing agricultural economy in the lower Umatilla Basin.

The project includes the diversion and conveyance infrastructure needed to deliver Columbia River water to irrigation districts in exchange for an equivalent amount of Umatilla River water left instream during critical migration periods for anadromous fish. It also provides a collaborative problem-solving forum and management system to ensure that the goals and benefits of the project are met.

Umatilla Basin Rules
Umatilla Basin policies and procedures, established by the Water Resources Commission through the Umatilla Basin Program, for the use and control of the state's water resources.

Umatilla Basin Program (Preamble)

(1) The Water Resources Commission is responsible for the establishment of policy and procedures for the use and control of the state's water resources. In executing this responsibility, the Commission develops, adopts and periodically modifies programs for the state's major drainage basins.

(2) Basin programs are administrative rules which establish water management policies and objectives and which govern the appropriation and use of the surface and ground water within each of the respective basins. The rules classify surface and ground waters according to the uses which are permitted, may establish preferences among uses, may withdraw surface and groundwaters from further appropriation, may reserve waters for specified future uses, and may establish minimum perennial streamflows. These rules are in addition to rules with statewide applicability which govern the allocation and use of water.

Waste
The continued use of more water than is needed to satisfy the specific beneficial uses for which a right was granted. The need for water shall be based on using the technology and management practices that provide for the efficient use of water considering: (a) The economic feasibility of use of the technology and management practices by the water user; (b) The environmental impacts of making modifications; (c) The available proven technology; (d) The time needed to make modifications; (e) Local variations in soil type and weather; and (f) Relevant water management plans and subbasin conservation plans. (1)

"Wasteful Use (of groundwater)" means any artificial discharge or withdrawn of ground water from an aquifer that is not put to a beneficial use described in a permit or water right, including leakage from one aquifer to another aquifer within a well bore. (1)

Water Allocation
OWRD Water Allocation Policy: The waters of the state shall be allocated within the capacity of the resource and consistent with the principle that water belongs to the public to be used beneficially without waste. Water shall be allocated among a broad range of beneficial uses to provide environmental, economic, and social benefits. The waters of the state shall be protected from over-appropriation by new out-of-stream uses of surface water or new uses of groundwater. (1)

Water budget
A summation of inputs (inflow, recharge), outputs (outflow, discharge), and the net changes to a particular water resource system over a fixed period. Because a watershed consists of extensive underground aquifers that are interconnected to some degree with streamflow and springs, it follows that development of either resource will affect the other, and consequently, will affect the water supply of all current and future water developments. Management for sustainability of any one water source will require an integrated approach that considers the water budget and dynamics between groundwater and surface-water resources.

Water Quality
The chemical, physical, and biological characteristics of water with respect to its suitability for a particular use. (4)

Water Quantity
"Customary Quantity" means the rate or annual amount of appropriation or diversion of water ordinarily used by an appropriator within the terms of that appropriator's water right (OAR 690-008-0001(3)).

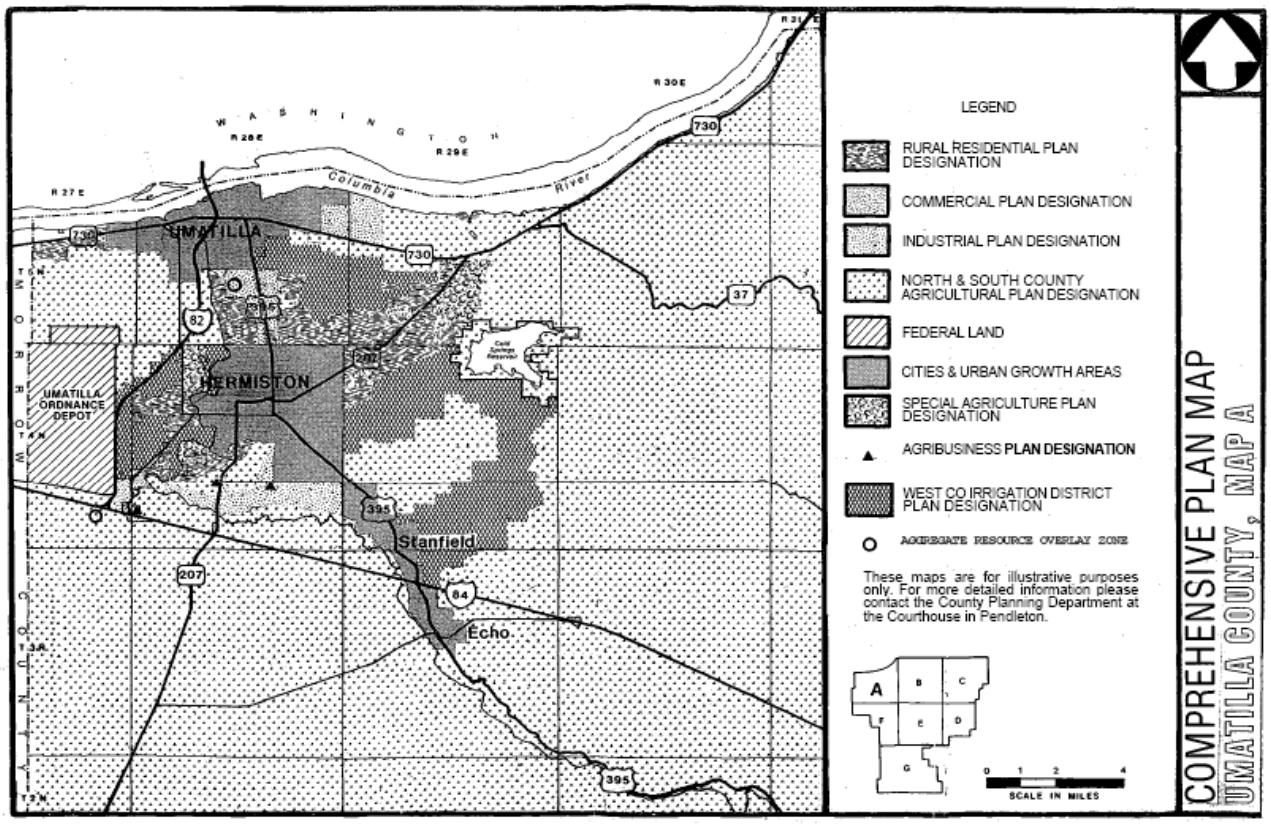
Watershed
The land area from which surface runoff drains into a stream, channel, lake, reservoir, or other body of water; also called a drainage basin. Watersheds are separated by ridgelines. (4)

Water table
The top of an unconfined aquifer; indicates the level below which soil and rock are saturated with water. The upper surface of the saturation zone. (4)

"Water Table" means the upper surface of an unconfined water body, the surface of which is at atmospheric pressure and fluctuates seasonally. The water table is defined by

Water Use
Water that is used for a specific purpose, such as for domestic use, irrigation, or industrial processing. Water use pertains to human's interaction with and influence on the hydrologic cycle, and includes elements, such as water withdrawal from surface- and ground-water sources, water delivery to homes and businesses, consumptive use of water, water released from wastewater-treatment plants, water returned to the environment, and instream uses, such as using water to produce hydroelectric power. (3)

West County


WASHINGTON
Columbia River
R 27 E
R 28 E
R 29 E
R 30 E
730
UMATILLA
HERMISTON
UMATILLA ORDNANCE DEPOT
82
207
395
Stanfield
Echo
84
37
T 5 N
T 4 N
T 3 N
LEGEND
RURAL RESIDENTIAL PLAN DESIGNATION
COMMERCIAL PLAN DESIGNATION
INDUSTRIAL PLAN DESIGNATION
NORTH & SOUTH COUNTY AGRICULTURAL PLAN DESIGNATION
FEDERAL LAND
CITIES & URBAN GROWTH AREAS
SPECIAL AGRICULTURE PLAN DESIGNATION
AGRIBUSINESS PLAN DESIGNATION
WEST CO IRRIGATION DISTRICT PLAN DESIGNATION
AGGREGATE RESOURCE OVERLAY ZONE
These maps are for illustrative purposes only. For more detailed information please contact the County Planning Department at the Courthouse in Pendleton.
A
B
C
F
E
D
G
0 1 2 4
SCALE IN MILES
COMPREHENSIVE PLAN MAP
UMATILLA COUNTY, MAP A

END NOTES

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[18]ORS 537.545
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[25] OWRD, "Umatilla Basin Report," 1988, page 30.
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[28]

http://www.scc.wa.gov/index.php?option=com_content&task=view&id=68&Itemid=284
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[30] Senate Bill 602, 74th Oregon Legislative Assembly – 2007 Regular Session.