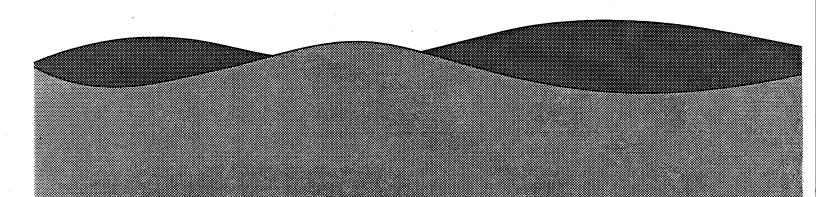
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Committee

September 1992



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### **ACKNOWLEDGEMENTS**

Many people contributed to the development of the Ground Water Management Plan between its start during the spring of 1989 and its acceptance by all six entities, the Idaho Department of Water Resources, and the Washington Department of Ecology in the spring of 1992. However, the plan would not have been completed without the effort of Kenneth A. Hall and the various people who served on the Management Plan Subcommittee. Some of those members were Jim Hudak, Mardi Baron, Jim Nebel, Pam Peterson, Ken Abbey, Craig Benjamin, and George Bloomsburg. The work of Jeff Filler as a consultant during the spring of 1990 also was necessary to get the plan pulled together so the committee could finish it. The work of all these people is acknowledged and appreciated.

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We hope the Ground Water Management Plan will serve the communities well in the years to come.

George Bloomsburg Executive Secretary Pullman Water Resources Committee

September 1, 1992

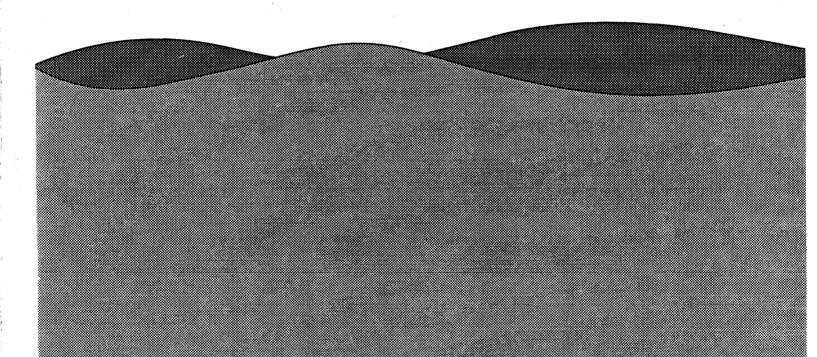


Table of Contenie

### THE PULLMAN-MOSCOW

### **GROUND WATER MANAGEMENT PLAN**

TABLE OF	CONTENTS	Pag
Chapter 1 Intr	oduction	Pag
	General	1 1 1
	and Washington State University Ground Water Basin Definition, Geology, and Land Use General Statement of Ground Water Concerns	2 6
Chapter 2 Histo		
	General	1 1
Chapter 3		
Autho	ority General	1
Chapter 4 The I	Pullman-Moscow Water Resources Committee	
	General	1 2 2
Chapter 5		
Gene	ral Basin Characteristics General	1 1 3 5
Chapter 6	nd Water Management Dian	
Grou	nd Water Management Plan Overview	1
		***

Table of Contents, Page 1

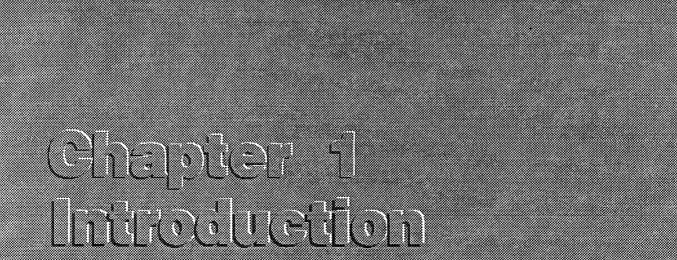
	Page
Chapter 6 (cont.) Five-Year Plan Review	_
Reporting	3
Reporting	3
Role of the Entities	5
Plan Adoption	5
Plan Implementation	5
Moscow Action Plan	6
Pullman Action Plan	8
Latah County Action Plan	10
Whitman County Action Plan	13
University of Idaho Action Plan	15
Washington State University Action Plan	17
Bibliography	1
Appendix A Intergovernmental Agreement	1
Appendix B Resolution of Understanding	1
Appendix C Public Input	1
Appendix D Suggested Research	1
Appendix E Committee Representatives	1
Appendix F Resolution to Adopt Interagency Agreement	1
Appendix G Resolution of Acceptance	1

Table of Figures

## THE PULLMAN-MOSCOW

### GROUND WATER MANAGEMENT PLAN

TABLE OF FIGURES		
Figure 1	Chapter	1
Figure 2	Chapter	1
Figure 3	Chapter	1
Figure 4	Chapter	2
Figure 5	Chapter	5
Figure 6	Chapter	5
Figure 7	Chapter ea	5
Figure 8	Chapter	5
Figure 9	Chapter ea	5
Figure 10	Chapter	5



### THE PULLMAN-MOSCOW

### **GROUND WATER MANAGEMENT PLAN**

### 1. INTRODUCTION

### 1.1 General

The Pullman-Moscow area of eastern Washington and northern Idaho relies almost entirely on ground water for its supply of municipal, institutional, and domestic water. Concern over declining ground water levels in the area motivated the municipalities and universities to form the Pullman-Moscow Water Resources Committee (hereafter referred to as the COMMITTEE) to address the declining ground water table issues and coordinate studies of the ground water and alternative water sources. The COMMITTEE has more recently been charged with developing a ground water management plan for the area by the governing states' water resource agencies. This document represents the plan developed by the COMMITTEE. The Pullman-Moscow Ground Water Management Plan (hereafter referred to as the PLAN). The purpose of the PLAN is to ensure that a safe supply of ground water, in terms of quantity and quality, will continue to exist for present and future use in the Pullman-Moscow Basin (hereafter referred to as the BASIN).

Chapters 1 and 2 provide introduction and historical background to the **PLAN**. Chapter 3 outlines ground water management in the context of state water laws in Washington and Idaho. Chapter 4 outlines the mission of the **COMMITTEE**. Chapter 5 describes technical aspects of the **BASIN** as well as the general response of ground water aquifers to pumping withdrawals. Chapter 6 contains the program in which management goals and strategies of the local entities are specified. A bibliography and appendices are also included.

### 1.2 Committee Membership

Membership of the COMMITTEE consists: Pullman, Washington; Moscow, Idaho; Whitman County, Washington; Latah County, Idaho; Washington State University; and the University of Idaho (the ENTITIES). Each of the ENTITIES has two representatives on the COMMITTEE. An Executive Secretary also serves the COMMITTEE as a part-time employee to perform administrative duties, provide technical assistance, and act as a liaison between the ENTITIES and other groups or individuals.

# 1.3 Charter between Pullman, Moscow, University of Idaho, and Washington State University

The **COMMITTEE** operates as the result of several intergovernmental agreements among the city governments of Pullman and Moscow, the two land-grant universities, and more recently, the two county governments.

Through a 1988 Intergovernmental Agreement (see section 4.2 and appendix A) the COMMITTEE is charged to coordinate planning in order to ensure a long-term supply of water for the ENTITIES, encourage water conservation, maintain an area ground water data base, investigate the primary and alternative water sources, and act as a liaison between the ENTITIES and the governing state agencies.

Through a **Resolution of Understanding** among the city and county governments, the universities, and the governing state water agencies (the Washington Department of Ecology and the Idaho Department of Water Resources), the state governments have agreed to work with the **COMMITTEE** in the formation of the **PLAN**.

### 1.4 Ground Water Basin Definition, Geology, and Land Use

The BASIN managed by the PLAN is defined roughly by the surface drainage areas of the South Fork of the Palouse River upstream of the confluence of Four Mile Creek and the South Fork of the Palouse River, and a portion of the Union Flat Creek Drainage, as shown in Figure 1. The studies of Smoot and Ralston (1987) and Lum, et al. (1990) includes this same area in addition to a portion of the main Palouse River drainage between Potlatch, Idaho and Colfax, Washington. For modeling purposes, the BASIN extends to the Snake River and includes the southwest facing side of the Snake River Canyon. Figure 2 shows the potential impact area of the PLAN. The area of potential impact includes the greater Palouse River Basin and the Lower Granite Pool on the Snake River.

Figure 3 shows graphically the main surface and subsurface components of the BASIN. Most of the BASIN is composed of loess loam soils overlaying many layers of basalt. In the eastern most part of the BASIN, the loess soils overlie the granitic basement formation, which extends downward and westward, forming a lower boundary to the basalts. The basalt formations and overlying loess soils continue westward from the BASIN toward the Columbia Basin of central Washington. Along the southwestern edge of the BASIN, the Snake River Canyon cuts deeply into the basalt flows, which are in places several thousand feet thick. Between the basalt layers lie sedimentary deposits (or interbeds). The basalts and interbeds make up the primary aquifer of the BASIN. As one moves westward in the BASIN from Moscow to Pullman, the interbeds become thinner and play a less important role in the ground water system.

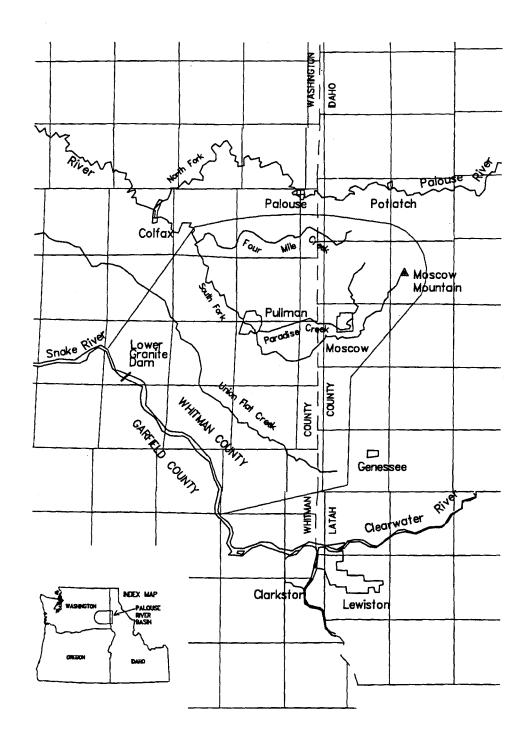


Figure 1. Pullman-Moscow Ground Water Basin (from Lum et al., 1990)

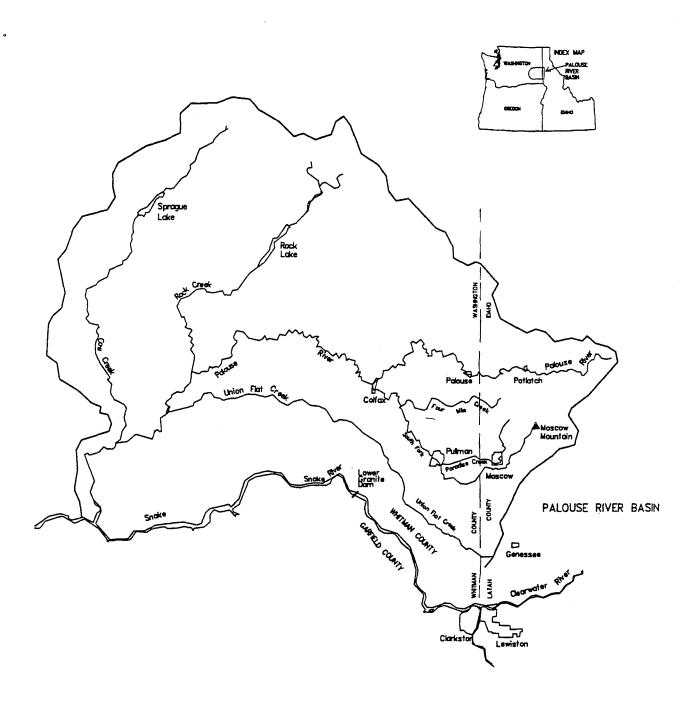


Figure 2. Pullman-Moscow Ground Water Management Plan Potential Impact Area

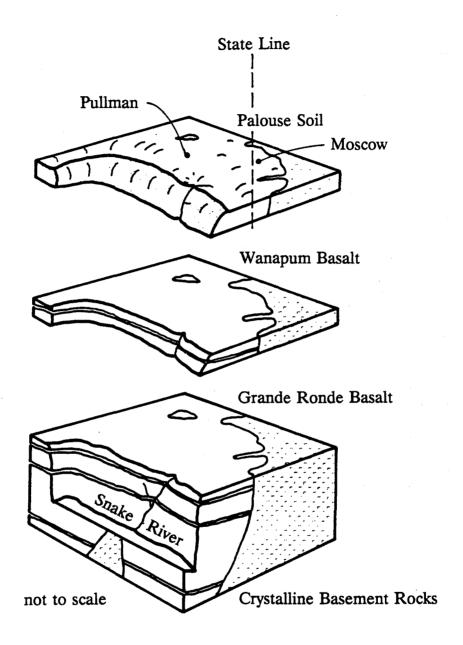


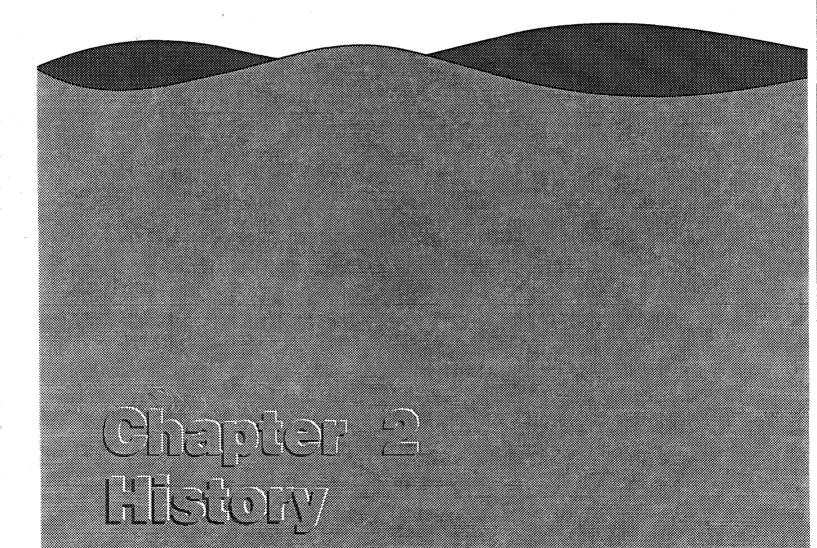
Figure 3. Graphical Representation of the Pullman-Moscow Ground Water Basin

The cities of Pullman and Moscow and the two universities are the major water purveyors in the BASIN. Most of the water is pumped from wells penetrating various depths of the basalt aquifers. Primary uses of the water are municipal, institutional, and private; essentially no ground water in the area is used for agricultural irrigation. Primary land use in the BASIN is dry-land farming of small grains, peas, and lentils. The high water storage capacity of the loess soils is sufficient to retain enough precipitation from the fall and winter months to carry most of the crops through the drier parts of the year. In the western part of the BASIN where the precipitation is less, successful dry land farming includes rotating the fields into fallow to allow sufficient moisture carryover from one year to the next. Prior to development, beginning in the 1800's, most of the BASIN was natural grassland and little was woodland.

Annual precipitation in the BASIN ranges from 15 inches along the Snake River to about 50 inches at the top of Moscow Mountain at the northeast corner. Precipitation averages 22 inches annually for Pullman and 24 inches annually for Moscow. Most of the precipitation in the area falls in the period November to June. In general, precipitation in the BASIN increases eastward and with increased elevation. Streams in the area flow generally to the west and northwest. Ground water in the BASIN is believed to flow primarily westward toward the Snake River.

### 1.5 General Statement of Ground Water Concerns

Water levels in many wells in the Pullman and Moscow areas have declined since their first use. At times, water level declines have averaged one to two feet per year and have been greatest near the city centers. Concerns over the water declines have motivated a number of geologic and ground water modeling studies for the BASIN, as well as an evaluation of possible alternative water supplies. Water quality issues are not a major concern in the BASIN, because ground water quality is excellent and meets all federal drinking water standards.



### 2. HISTORY

### 2.1 General

Prior to the turn of the century, free flowing artesian wells were observed in both Pullman and Moscow. Water usage over the years has caused water levels in both the Pullman and Moscow areas to decline, at rates of one to two feet per year (Figure 9, see Chapter Section 5.4). Originally it was believed that Pullman and Moscow obtained water from different aquifers, due to differences in the water chemistries. As Moscow city wells were drilled deeper during the 1960's, it became apparent that both cities are served by a larger common ground water system. Water levels under both cities continued to decline, and several geologic and ground water modeling studies have investigated the dependability of the Pullman-Moscow aquifers for meeting future water use needs. Studies also have been made of possible alternative water sources for the area. Although the ENTITIES have had to drill deeper wells over time to obtain water, costs of obtaining and providing water in the area are lower than in many areas of the nation.

### 2.2 Geologic Studies

A number of geologic and geohydrologic studies have been conducted over parts or all of the **BASIN**. Exhaustive lists of previous investigations can be found in Ross (1965), Smoot and Ralston (1987), and Lum, *et al*. (1990). Ten Eyck and Warnick (1984) have provided a comprehensive annotated catalog of reports and studies pertinent to the Pullman-Moscow water supply.

Russell (1897) reported flowing artesian wells in Pullman and Moscow in the 1890's. Foxworthy and Washburn (1963) and Walters and Glancy (1969) provided significant geohydrologic studies of the area. Foxworthy and Washburn (1963), Ross (1965), Ringe (1968), Brown (1976), and Cotton (1982) have provided discussions of the geology of the BASIN. Klein (1987) and Bockius (1985) provided information on the basalt depths and basalt/granite interface. These and other studies of the BASIN have resulted in a general understanding of the ground water system as discussed in Sections 1.4 and 5.2, and used in more recent studies of Smoot and Ralston (1987) and Lum, et al. (1990).

### 2.3 Model Studies

Ground water studies of the BASIN have been conducted to provide a better understanding of the ground water system and to evaluate or predict future ground water levels. Jones and Ross (1972) modeled the ground water system of Moscow. Their results suggested that pumping in Moscow area wells was less than the recharge to the area, and that ground water should be able to sustain the needs of Moscow beyond the year 2000. Jones and Ross also suggested that the use of artificial recharge through recharge wells may be feasible for the upper portion of the Moscow area aguifers.

Barker (1979) used a two-dimensional ground water model to study the ground water system supplying both Pullman and Moscow. Barker considered an area of roughly 8-mile radius centered around Pullman. He modeled the subsurface aquifers as a single basalt system. His model underestimated water level declines for the area; water levels estimated for the year 2000 were reached by 1985.

Smoot and Ralston (1987) and Lum, et al. (1990), studied the BASIN using updated geologic information and a more complex, three-dimensional ground water model. The BASIN boundaries used by Barker were expanded to include the entire management BASIN shown in Figure 1 as well as a portion of the main Palouse River between Potlatch, Idaho and Colfax, Washington. The basalt formations were divided into an upper Wanapum basalt layer and a lower Grande Rhonde basalt. The BASIN was divided horizontally into squares 1/2-mile on a side. In the vertical direction, the BASIN was divided into 3 layers: one layer representing the loess soil profile, and two layers representing the basalt formations.

Results of the model studies by Smoot and Ralston (1987) and Lum, et al. (1990), suggest that the continuation of water level declines would depend on the rate of usage of the aquifers. These model studies suggest "that ground water levels would stop declining if ground water pumpage were to stabilize at a constant level. However, ground water levels will continue to decline in the foreseeable future as long as ground water pumpage continues to increase" [Lum, et al., (1990) page 1]. Both studies also suggest that the present rate of water withdrawal is somewhat less than the rate at which the BASIN is recharged.

### 2.4 Alternative Water Sources (Imported Water)

Water level declines in the BASIN have motivated studies of alternative sources of water for the area. Ebasco Services (1958) suggested that supplemental water supplies could be obtained using surface storage reservoirs in the BASIN. A number of water transfer schemes bringing water from outside the BASIN were also considered, ie., diversion from the Potlatch River near Julietta; diversion from the Clearwater River upstream from Lewiston; and diversion from the North Fork of the Palouse River. Stevens, et al. (1970) proposed six potential water supply sources: two diversion and storage schemes using the North Fork of the Palouse River; two schemes utilizing water from the Potlatch River; a scheme utilizing water pumped from Dworshak Reservoir; and a scheme of pumping water from Lower Granite Reservoir near Wawawai. Stevens, et al. (1973) also reported on a reconnaissance level feasibility study of a combined pumped-storage municipal water supply project near Union Flat and Almota Creeks.

Some of the above schemes as well as a number of proposed flood control projects for the Palouse River Basin are summarized in a recent reconnaissance study by the U.S. Corps of Engineers (1989). The proposed alternatives identified by the corps are shown in Figure 4. Ground water and municipal water supply concerns in the BASIN have not

been severe enough to motivate further study of these alternatives as of spring 1990.

### PROPOSED ALTERNATIVE MUNICIPAL WATER SOURCES

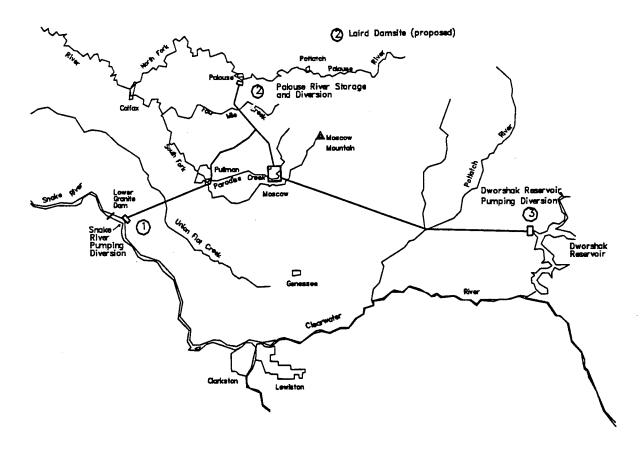


Figure 4. Proposed Municipal Water Supply Alternatives (as identified by the Corps of Engineers, 1989).

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### 3. AUTHORITY

### 3.1 General

The state governments of Washington and Idaho are charged with the administration of ground and surface water rights within their boundaries. Ground and surface waters are considered public property, and are "appropriated" in the form of "water rights". In the states of Washington and Idaho, water rights are obtained and protected in terms of a "prior appropriation" doctrine, such that a right that is "first in time" is "first in right". Water rights are generally established (through an application process) by diverting water that has not been previously appropriated and putting it to a beneficial use. In principle, the prior appropriation doctrine mandates that in periods or conditions of water shortage, "junior" (in time) water rights holder's water supplies are reduced or terminated to protect the "senior" rights.

The appropriation of ground water is generally limited to the amount of natural recharge to the BASIN or aquifers. However, the natural recharge to a ground water system is often difficult or impossible to determine. As a result, a recharge criterion is rarely satisfactory for actually limiting ground water use. Instead, water use is generally limited on the basis of feasible or economic pumping lift and potential impairment to present or senior users. In conditions of over-appropriation of ground or surface water, junior water rights are generally regulated in favor of valid senior water rights.

### 3.2 Administration Under the Washington Code

In Washington, ground water use is limited to provide a "safe sustained yield" to existing water rights. The safe sustained yield criterion includes the protection of economic or feasible pumping lift and protection against impairment of present or senior users.

Washington code also allows for the designation of "Ground Water Management Areas" and "subareas". Ground Water Management Areas may be designated in areas of existing or potential water supply problems (either quantity or quality). The Ground Water Management Area Program in Washington is designed to promote ground water management at the local level with assistance (both administrative and financial) from the state.

Codes specific to ground water use in Washington are listed below.

- Appropriation doctrine for ground water--Revised Code of Washington (RCW) 90.44.010.
- Administration of Ground Water Rights--RCW 90.44 and Washington Administrative Code (WAC) 173-100.050.
- Ground water use limited so as to maintain a safe sustained yield--RCW 90.44.130.

- Prevention of ground water waste--RCW 90.44.110.
- Impairment of senior users--WAC 173.150.050.
- Definition of impairment--WAC 173.150.060.
- Determination of reasonable or feasible pumping lift--WAC 173.150.050.
- Adjudication of ground water rights--RCW 90.03.110 and 90.44.220.
- Ground Water Management Areas and Subareas--RCW 90.44.180 and 90.44.400.
- Ground Water Management Areas and Programs--WAC 173-100.050.
- Protection of upper aguifer zones--WAC 173-154.
- Protection of withdrawal facilities associated with ground water rights--WAC 173-150.
- Well drillers licensing and well construction programs--RCW 18.104.

### 3.3 Administration under the Idaho Code

Ground water in Idaho is managed using three principle criteria: 1) Ground water development or use must not exceed the average annual recharge to the basin; 2) existing ground water users must be protected in regard to reasonable pumping levels; and 3) a reasonable enforcement of relative priorities among users must not block full economic development of a ground water basin. In Idaho, the Director of Water Resources may restrict any water right application based on the above criteria.

Idaho code also allows for the designation of Ground Water Management Areas. A Critical Ground Water Area may be designated wherever or whenever the ground water supply is insufficient to provide for irrigation or other uses at the present rate of withdrawal. In a Critical Ground Water Area, the Director of Water Resources may deny future water right applications as well as terminate or reduce present use, in accordance with priority dates. Ground Water Management Areas may be designated in areas believed to be approaching the "Critical" stage. In such areas the Director may also deny future permit applications and reduce present usage. Ground Water Management Area designation can be brought about by a decree of the Director, while Critical Ground Water Area designation involves a public hearing procedure.

Codes specific to ground water use in Idaho are listed below.

Appropriation doctrine for ground water--Idaho Code (IC) 42-103.

- Administration of ground water--IC 42-201.
- Ground water use limitation in regard to natural recharge--IC 42-.237a.
- Prevention of ground water waste--IC 42-237a.
- Protection of reasonable pumping levels--IC 42-226.
- Impairment of senior users--IC 42-226.
- Adjudication of water rights--IC 42-1406.
- Ground Water Management Areas--IC 42-233b.
- Critical Ground Water Areas--IC 42-233b.
- Recharge Districts--IC 42-4201A and 42-4202.

# Chapter L Fullment/loggery Usica Resources Committee

### 4. THE PULLMAN-MOSCOW WATER RESOURCES COMMITTEE

### 4.1 General

A Pullman-Moscow Water Resources Committee represented by Pullman, Moscow, University of Idaho, and Washington State University was formed in 1967 to undertake a cooperative effort in addressing the water supply problems being faced by the ENTITIES. Since its formation, the COMMITTEE has supported a number of studies of the local ground water resource and alternative sources of water for the ENTITIES. The COMMITTEE has worked in cooperation with the Washington Department of Ecology, the Idaho Department of Water Resources, the U.S. Geological Survey, and the U.S. Army Corps of Engineers on numerous water issues. The COMMITTEE has also retained various consultants on water supply issues or concerns. In 1988, membership of the COMMITTEE was extended to Whitman and Latah Counties. In 1989, a Resolution of Understanding was developed among the COMMITTEE and the State agencies whereby the COMMITTEE would, with assistance of the two States, develop the PLAN for the BASIN.

Member ENTITIES are outlined in Section 1.2. Representatives of the ENTITIES at the time of plan adoption are listed in Appendix E.

Costs of operating the **COMMITTEE** are borne by the **ENTITIES** and include salaries and consultant fees, clerical help, research and publishing costs, and other expenses. Costs are divided between the **ENTITIES** according to shares. The two cities and two universities have two shares each, while each of the counties has one share, for a total of ten shares.

### 4.2 Intergovernmental Agreements

Several intergovernmental agreements have been executed by the **ENTITIES** for purposes such as retaining consultants, determining operating budgets, and defining membership. Specific purposes of the Intergovernmental Agreement of 1988 (which superseded previous agreements) are listed below:

- 1. Coordinate planning to assure a long-range supply of water to the ENTITIES.
- 2. Update and expand the data base already begun during earlier studies.
- 3. Encourage conservation in order to extend the useful life of the aquifers.

- 4. Investigate alternative sources of water which can meet the incremental increases in demand of the region.
- 5. Educate and advise the **ENTITIES** and the public on the quality and quantity of the public water supplies serving Pullman, Moscow, and the surrounding area.
- 6. Act as a liaison between the ENTITIES on water resource concerns.
- 7. Promote communication between the ENTITIES, the Washington State Department of Ecology, and the Idaho Department of Water Resources (see Appendix for full document).

### 4.3 Role of the Executive Secretary

In 1988 the paid position of an Executive Secretary for the **COMMITTEE** was established. Specific duties of the Executive Secretary are summarized below:

- 1. To maintain a data base of information on the BASIN ground and surface waters, including pumping records and copies of reports written on the BASIN over the past 100 years.
- 2. To serve as a liaison between the two state water agencies and the **COMMITTEE**.
- 3. To serve as an advisor to the **COMMITTEE** concerning technical aspects of proposed future studies.
- 4. To provide continuity to the COMMITTEE.
- 5. Perform administrative services of the **COMMITTEE** including minutes and mailings.
- 6. Aid the **COMMITTEE** in formulating an action plan for the **ENTITIES** (see Appendix for full document).

### 4.4 Resolution of Understanding

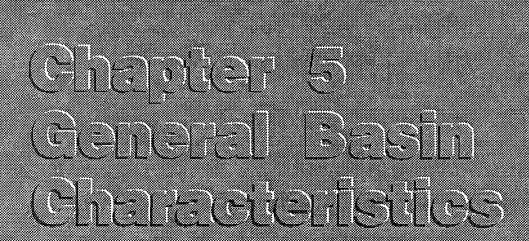
Specific Objectives agreed upon in the Resolution of Understanding of 1989 among the ENTITIES and the state water agencies are listed below:

- 1. The **COMMITTEE** will pursue funding to conduct and promote studies and research relative to improving knowledge of the water resources of the **BASIN**.
- 2. The **COMMITTEE** will prepare a management plan for the **BASIN** in cooperation with the two state agency parties, The Washington State Department of Ecology and the Idaho State Department of Water Resources, which will address both water quantity and water quality concerns.

- 3. The **COMMITTEE** will prepare, as an initial step in the development of the management plan a principal work plan and time schedule which will outline the concerns and issues to be studied. This work plan will indicate the party or parties with responsibilities for each task and an estimated schedule for completion of each task.
- 4. The **COMMITTEE** will encourage public involvement in the development of the **PLAN** through public hearings and education programs.
- 5. The **COMMITTEE** will facilitate the implementation of the **PLAN** in concert with the member **ENTITIES** (see Appendix for full document).

### 4.5 Committee Role - Past, Present, and Future

The COMMITTEE has provided a coordinated effort among the ENTITIES in addressing water supply concerns and issues for the BASIN. This effort has resulted in a number of studies being performed in cooperation with other government agencies and private consultants. This effort has also resulted in the charge for the COMMITTEE to develop the PLAN. The COMMITTEE will continue to coordinate cooperative management of the BASIN ground water resources, and act as an advisory and oversight body in the implementation of the PLAN. The COMMITTEE's role pursuant to the PLAN is discussed in greater detail in Section 6.3.



### 5. GENERAL BASIN CHARACTERISTICS

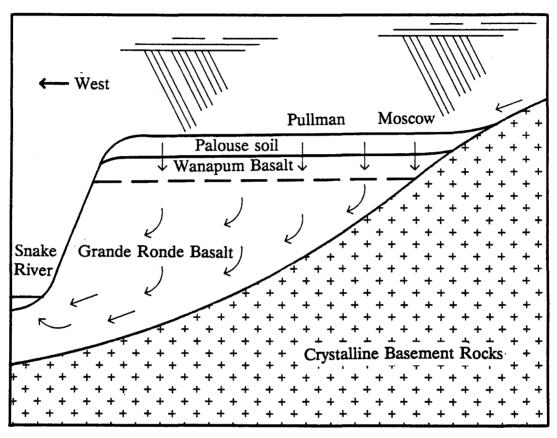
### 5.1 General

For effective ground water management, it is essential that water managers, water users, decision makers, and the general public have a basic understanding of the BASIN aquifers, as well as the general response of the aquifers to pumping or usage. In this chapter, basic characteristics of the BASIN aquifers are explained, as well as observed responses of the aquifers to pumpage and recharge. Also included in this chapter are historical and current information on the BASIN ground water system.

### 5.2 Ground Water Flow and Storage in the Pullman-Moscow Basin

Ground water in the BASIN originates as precipitation in the form of rain or snow (Figure 5). Some of the precipitation runs off directly and leaves the BASIN as stream flow. Precipitation that does not run off directly infiltrates into the soil, and may move downward, laterally, or may be stored in the soil for consumptive use by surface vegetation. Water that is not used consumptively by plant cover moves further downward and may form saturated zones in the soil. From the soil water table, the water may continue to move downward toward the basalt formations or laterally toward streams in the area. Streams that lie above the water tables may also lose water into the ground water system. Wells can be drilled into the soil water tables, but generally yield relatively small amounts of water due to the low soil permeability.

Ground water that reaches the basalts generally is stored in or travels through voids in the basalt and inter-lying sedimentary deposits. These voids may be in the form of cracks and joints in the basalts or spacing around individual grains in the sedimentary deposits. Model studies of the BASIN supported by field investigations suggest that the general direction of ground water flow is downward and toward the west. Some of the ground water near the surface of the basalt formations may move into streams in the BASIN. Ground water that is deeper in the aquifers moves toward and eventually discharges into the Snake River, seeps out along the Snake River canyon walls, or moves farther westward toward the Columbia basin. The movement of ground water toward the west and downward in the aquifers is the result of a potential or hydraulic gradient in those directions. Water levels in wells generally decline or are deeper in the aquifers to the west.



Cross-section not to scale

Figure 5. Conceptual Representation of Surface and Ground Water Flow in the Pullman-Moscow Basin.

The basalt flows terminate near the eastern edge of the BASIN east of Moscow. Where there is no basalt, ground water is believed to flow along the westward sloping granitic basement formation and enter the basalt aquifers at the basalt-basement interface (Figure 5). Exact ground water flow paths and travel times in the BASIN are not known. In the Moscow area, the shallow Wanapum Basalt layer plays a more important role in the ground water system. Effective ground water management in the Moscow area will need to consider the somewhat distinct (and yet interconnected) behavior of the upper Wanapum and deeper Grande Rhonde Basalt zones of the aquifers.

### 5.3 Ground Water Response to Usage

Under natural conditions, a balance exists between the amount of ground water being discharged from a basin (in this case to the Snake River, streams in the BASIN, or toward the Columbia Basin), and the recharge or amount of water coming into the BASIN in the form of precipitation or percolation from streams or other water bodies. When ground water is pumped (or removed artificially) from a ground water system, the natural balance is interrupted.

When water is pumped from a well, the water level, or corresponding water pressure near the well, is lowered, or drawn down (Figure 6). This draw-down provides the pressure gradient that causes the ground water to flow toward and into the well. Draw-down due to pumping is greatest near the pumping center and decreases outward. As pumping from the well continues, the extent of the lowered water levels expands, forming a cone of depression around the well or pumping center. This cone of depression expands until a new equilibrium condition is reached. The new equilibrium condition generally results in:

- a decrease in natural discharge from the BASIN;
- a decrease in the amount of ground water stored in the BASIN; and
- an increase in BASIN recharge.

In the BASIN, pumping withdrawals may result in decreased discharge to streams in the area, decreased discharge to the Snake River, and decreased ground water flow westward toward the Columbia Basin. Since surface water usage in the BASIN is minimal, such changes in discharge are not of primary concern.

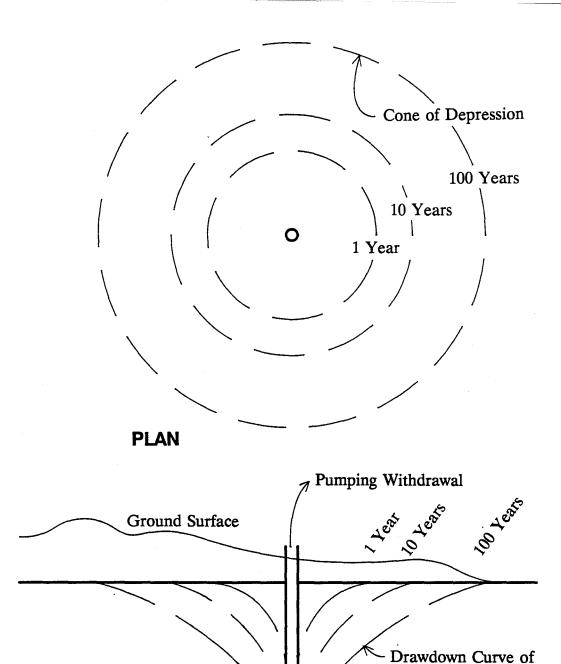


Figure 6. Conceptual Representation of Draw-down of Water Levels Over Time Around an Area of Constant Pumping.

WELL

Lines of Equal Pressure or Water Surface

**PROFILE** 

Cone of Depression

The cone of depression caused by pumping always lowers the ground water levels or pressures around the well, regardless of the amount of recharge. Some ground water storage will always be lost with pumping. In areas where there are several wells operating at significant withdrawal rates, for example in or around a municipality, the effects of pumping several wells will be similar to that of a single well, ie., water levels will be drawn down throughout and around the area containing the wells. The area containing and surrounding the wells will always experience some water level decline. In the BASIN this effect can be seen by the reduced water levels in and around the two major cities, with the declines decreasing outward. Ground water levels farthest from the major pumping centers have experienced the smallest declines, and in some places may approximate pre-development conditions.

In some basins, a lowering of the ground water table can actually cause a greater amount of water to be recharged to the basin as excess surface water is diverted into the ground water system by the water level change. This effect, however, does not appear to play a significant role in the **BASIN**. Studies are presently underway at the University of Idaho in regard to ground water recharge from area streams (see Ralston and Li, 1989).

The response of a ground water system to pumping is more complicated than diversion of surface waters. The effects of surface water diversions are generally observed immediately and generally occur only in the downstream direction. The effects of ground water withdrawals, on the other hand, are not confined to a single direction. In fact, pumping may affect water levels in a basin in all directions. Furthermore, the time required for pumping effects to reach various points in a ground water system often takes years. In this regard, ground water management may be difficult, and model studies can play an important role.

As long as the discharge (both natural and pumping) from a basin is less than the recharge, water level declines (the time-lag effect notwithstanding) will be roughly proportional to the pumping amount. When the discharge from a basin exceeds the natural recharge, ground water levels will continue to decline, and ground water will be mined or depleted, even when pumping is held constant. Careful monitoring and analysis of ground water levels in an area are important to assure that such a condition does not develop.

Recent modeling studies of the Pullman-Moscow ground water basin [Lum et al. (1990)] suggest that mining is not occurring and that declining water levels are the result of increased pumping rates. This result needs to be further investigated by additional model studies.

### 5.4 Present Basin Conditions

Present (1990) water levels in principal wells in the BASIN are at an elevation of about 2260 feet (above mean sea level) for Pullman, and 2250 feet for Moscow. Due to topographical differences between and

within the cities, water levels are approximately 75 to 250 feet below the land surface in the Pullman/Washington State University wells, and some 300 feet below the surface in the Moscow/University of Idaho wells.

Figure 7 shows the historical combined pumping of Pullman, Moscow, Washington State University, and the University of Idaho. Pumping volumes are averaged over 5-year periods and, therefore, do not directly reflect year-to-year variations. Figure 8 shows more recent pumping withdrawals for the BASIN. Withdrawals by the city of Pullman are combined with Washington State University; Moscow withdrawals are combined with those of the University of Idaho. As the figures indicate, pumping withdrawals have generally stabilized for both communities over the last 15 years.

Figures 9 and 10 show historical ground water levels in the Pullman and Moscow areas. Water levels in the Moscow area have stabilized (as of 1985-1989), while water levels in Pullman continue to show some decline.

# **Pullman Moscow Aquifer**

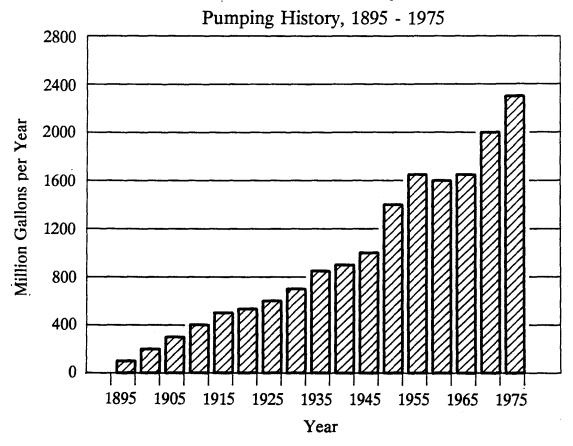


Figure 7. Historical Pumping Withdrawals in the Pullman-Moscow Area (Data from Lum, et al., 1990, Figure 9).

# **Pullman Moscow Aquifer**

Pumping History, 1975 - 1989

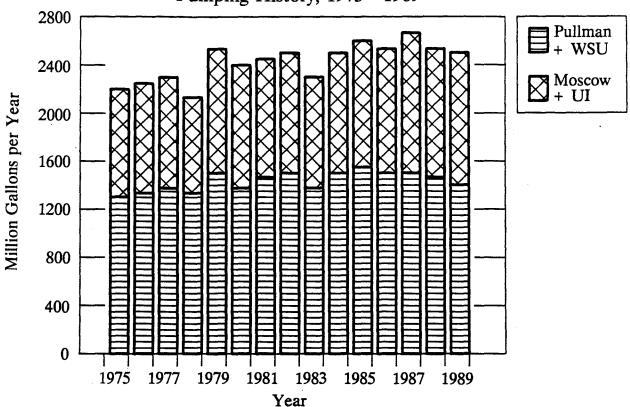


Figure 8. Recent Withdrawals in the Pullman-Moscow Area (Data from Pullman-Moscow Water Resources Committee).

# **Pullman Moscow Aquifer**

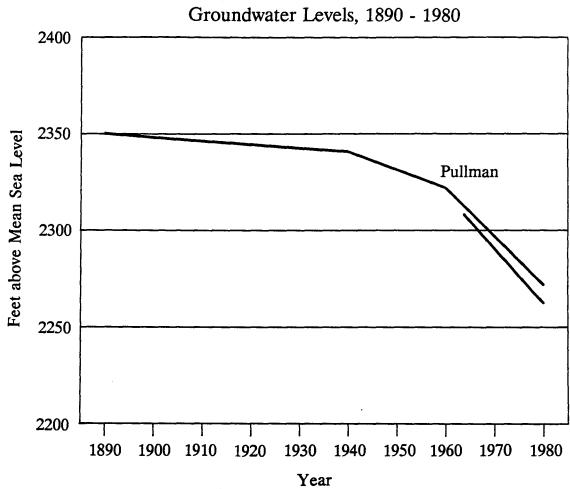


Figure 9. Historical Ground Water Levels in the Pullman-Moscow Area (Adapted from Lum, et al., 1990).

# Pullman Moscow Aquifer

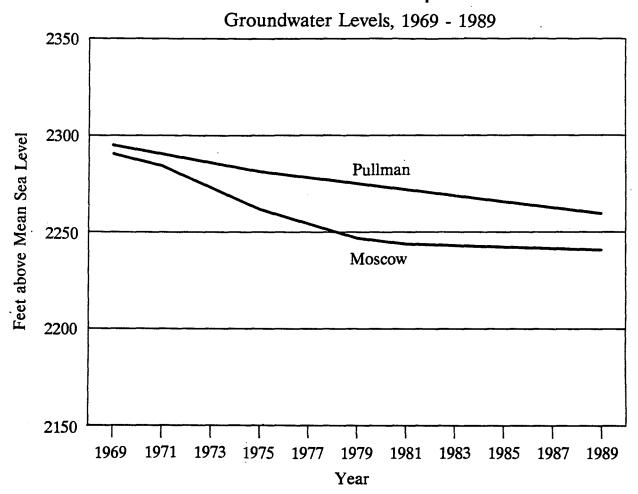
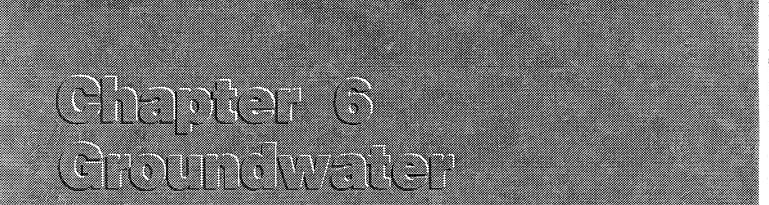


Figure 10. Recent Ground Water Levels in the Pullman-Moscow Area (Data from the Pullman-Moscow Water Resources Committee).



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#### PULLMAN-MOSCOW WATER RESOURCES COMMITTEE

#### **ACTION PLANS**

#### 6. GROUND WATER MANAGEMENT PLAN

#### 6.1 Overview

Successful management of the Pullman-Moscow ground water resource requires the utilization of an effective management plan. This chapter describes the role of the **COMMITTEE** and its goals and actions. Also in the chapter are the stated action plans of the **ENTITIES** for achieving the goals of the **PLAN**. The need for educational programs and conservation activities are addressed in the following paragraphs. Provisions for annual reviews of these adopted plans, reporting procedures, data maintenance, and recommended research for the **BASIN** are also set forth.

# 6.2 Role of the Committee

The role of the COMMITTEE is to encourage ENTITIES to implement the PLAN. The COMMITTEE will also monitor the success of the ENTITIES in carrying out their action plans and achieving the goals of the PLAN. Each ENTITY will be expected to adopt an action plan, interfacing with the stated goals of the PLAN. The COMMITTEE will provide guidance related to water-use plans, conservation strategies relative to water use, implementation policies, and the preparation of local ordinances or zoning regulations.

# 6.2.1 Education and Information Exchange

One of the key functions of the **COMMITTEE** will be to provide a forum for the exchange of successful and effective management policies, strategies, and techniques among the **ENTITIES** and other interested groups and governing bodies. Public involvement and education in **BASIN** water management issues are extremely important. The success of public education and the level of participation in conservation and other water resource issues will be assessed annually. It will be incumbent upon the members of the **COMMITTEE** to keep abreast of effective water resource management practices and articulate these concepts to the **ENTITIES** and their constituents. Action plans will be revised as new techniques for managing the ground water and better understanding of the basin ground water system become available.

#### 6.2.2 Data Base

It shall be the responsibility of the **COMMITTEE** to continue to gather, maintain, and evaluate a data base of well locations, water consumption, and water levels for the **BASIN**. The **COMMITTEE** will

develop a program of data monitoring and analysis to better evaluate the ground water system response to consumption patterns. From this information, the **COMMITTEE** will ascertain **BASIN** water consumption and water level data in conjunction with the goals of the **PLAN**. Furthermore, the **COMMITTEE** will begin accumulating information and data related to monitoring the quality of the ground water. State and Federal water management agencies will be consulted and worked with in order to maximize effective data gathering and analysis.

#### 6.2.3 Research

Many research projects have been completed over the past decade in the hopes of better understanding the BASIN configuration. From this research has evolved a conceptual view of the aquifers system with the acceptance of the USGS MODEL. To further refine the MODEL, the COMMITTEE will continue to acquire, maintain, and upgrade information as it relates to the ground water system.

This research will need to continue to be a cooperative effort with state, federal, local, and private sources. Over the course of the next several years, the COMMITTEE will establish research priorities essential to furthering the understanding of the BASIN.

Research regarding the BASIN will be conducted in the following main areas:

- Model studies to evaluate the effects of various alternative management strategies on the aquifer;
- Field investigations to better determine the geologic and hydrogeologic characteristics of the BASIN; and,
- Economic or cost-feasibility studies of various alternative conservation measures and incremental water supply sources.

These research areas are outlined in greater detail in Appendix D. It will be the responsibility of the **COMMITTEE** to prioritize actual research needs, set budgets for such activity, and identify and solicit revenue sources.

# 6.2.4 Annual Reports

The **PLAN** will be reviewed at least annually by the **COMMITTEE**. The **COMMITTEE** will be responsible to see any annual adjustments or changes in the **PLAN** are endorsed by the governing state agencies and adopted by the **ENTITIES**.

#### 6.2.5 Five-Year Plan Review

At the end of each five-year cycle a detailed PLAN review will be made and the PLAN will be modified as necessary to reflect the changing needs of the ENTITIES and the PLAN. The goals, recommended

strategies, and research priorities will be evaluated in regard to changing physical, economic, social, and political conditions of the Pullman-Moscow area. These revisions will be implemented based upon updated BASIN information, the success of particular management strategies, and input from public hearings. The adoption and implementation of any changes to the PLAN will be done with the full review of the ENTITIES and the two state agencies.

## 6.2.6 Reporting

The COMMITTEE will provide five year progress reports summarizing the success of the PLAN. The report will be made available to the public, the ENTITIES, and the state agencies detailing the progress made on each of the PLANS' goals as well as the success of the ENTITIES in implementing this action plan. Furthermore, water usage and water level trends in the BASIN will be documented in relationship to the MODEL and the target goals of the PLAN.

#### 6.3 Goals of the Committee

The following goals and their expanded definitions form the foundation of the PLAN. The ENTITIES are to include in their respective action plans strategies for attaining the goals of the PLAN. The action plans combined with the COMMITTEE's goals form the substance of the PLAN.

#### - GOAL -

• TO PROVIDE FOR FUTURE BENEFICIAL USE OF THE BASIN GROUND WATER WITHOUT DEPLETING THE BASIN AQUIFERS WHILE PROTECTING THE QUALITY OF THE WATER.

The primary goal is to insure that a stable ground water level is maintained in the BASIN aguifers. The COMMITTEE adopts the standard that the two universities and the two cities shall attempt to limit their annual aquifer pumping increases to one percent (1.0%) of their pumping volume based on a five (5) year moving average starting with 1986. At no time shall the accumulated total pumping exceed 125% of the 1981-1985 average for the two universities and the two cities. These initial limits on pumping rates are based upon historical data and water levels predicted by the MODEL. An estimate of the dispersed county pumping will be made based on an average per capita use for all county residences within the BASIN boundaries. Latah and Whitman counties will attempt to limit pumping increases from the BASIN aguifers to 125% of the estimated 1990 pumping levels. Further refinement of the MODEL will be necessary to establish acceptable limits on long term pumping rates which will confirm a stable water level for future users. The COMMITTEE will update the MODEL periodically and

acceptable pumping levels may be modified upward or downward upon agreement by the ENTITIES.

- GOAL -

 TO PROMOTE A PROGRAM OF PUBLIC EDUCATION AND AWARENESS REGARDING BASIN GROUND WATER MANAGEMENT ISSUES.

The **COMMITTEE** shall pursue and develop a program of public education to encourage conservation and reuse of water. Programs soliciting public support for committee activities and efforts to stabilize the water level will be developed.

- GOAL -

• TO PROMOTE CAREFUL MONITORING AND ANALYSIS OF THE GROUND WATER LEVEL AND USAGE DATA FOR THE BASIN.

The **COMMITTEE** shall continue to maintain records of the ground water levels and usage data collected on the **BASIN**.

- GOAL -

• TO CONTINUE TO EXPLORE POSSIBLE SUPPLEMENTAL WATER SOURCES FOR ANTICIPATED AND POTENTIAL FUTURE WATER USE IN THE BASIN.

The COMMITTEE shall pursue the development of a Least Cost Plan (LCP) for providing supplemental water which will be completed within three years after the date of acceptance of this PLAN by all six ENTITIES and the states. The LCP shall evaluate potential incremental sources of water for the region and the relative costs of such sources. The information documented in the LCP shall be used in refining a course of action to insure an adequate long term water supply for the ENTITIES. The LCP shall be updated when the COMMITTEE determines there is just cause for an update.

- GOAL -

• TO REVIEW AND MAKE RECOMMENDATIONS ON ALL WATER USE OR LAND USE APPLICATIONS WHOSE ANTICIPATED IMPACT ON THE GROUND WATER SYSTEM POTENTIALLY LIES OUTSIDE THE STATED GOALS OF THE PLAN OR POLICIES ADOPTED BY THE MEMBER ENTITIES.

 TO REVIEW AND MAKE RECOMMENDATIONS RELATIVE TO THE DEVELOPMENT OF AN AGREEMENT FOR WATER TRANSFERS ACROSS THE STATE LINE.

#### 6.4 Role of the Entities

Responsibility of implementation of the PLAN rests with the ENTITIES.

#### 6.4.1 Plan Adoption

Each ENTITY will incorporate the PLAN into their respective city or county comprehensive plan or university development plan.

#### 6.4.2 Plan Implementation

In conjunction with the PLAN, each ENTITY has developed an action plan supporting the goals of the PLAN. The action plan adopted by each ENTITY is enumerated in the following paragraphs. Each ENTITY reserves the right to modify and improve its individual action plan as it deems appropriate. However, each modification shall be made in accordance with the provisions of the PLAN.

Specific reference to the issue of *Growth and Potential Developers* will be addressed in each **ENTITY's** action plan as follows:

- Incorporate into each ENTITY's comprehensive plan anticipated growth rates and corresponding water usage increases with strategies for meeting the water needs of the community, county, or university.
- Adopt regulations requiring developers to provide water conservation, re-use, and recycling plans along with anticipated use and impact statements before their developments are approved. (See Washington interim guidelines for major water users.)

## ACTION PLANS OF THE ENTITIES

Moscow Action Plan

The following is the action plan of the City of Moscow. It specifically supports the goals of the COMMITTEE as appropriate for this ENTITY, as stated in the PLAN, and as referenced below. In no case is this action plan intended to be in conflict with the PLAN.

#### **COMMITTEE** Goals:

- To provide for future beneficial use of the BASIN ground water without depleting the BASIN aquifers while protecting the quality of the water.
- To promote a program of public education and awareness regarding BASIN ground water management issues.
- To promote careful monitoring and analysis of ground water level and usage data for the BASIN.
- To continue to explore possible supplemental water sources for anticipated and potential future water use in the BASIN.
- To review and make recommendations on all water use or land use applications whose anticipated impact on the ground water system potentially lies outside the stated goals of the PLAN or policies adopted by the member ENTITIES.
- To review and make recommendations relative to the development of an agreement for water transfers across the state line.

In support of the **COMMITTEE** goals and activities, the City of Moscow proposes to:

- Attempt to limit annual aquifer pumping increases to one percent (1.0%) of the pumping volume based on a five (5) year moving average starting with 1986 (745 mgy). At no time shall the accumulated total pumping exceed 125% of the 1981-1985 average (increase from 700 mgy to 875 mgy).
- Continue summer/winter differential water rates.
- Require developers to project water use.
- Participate in programs that offer free water conserving devices to customers.

- Create a conservation fund with a four cents/1,000 gallon surcharge to customers to pay for those devices, to fund research projects recommended by the COMMITTEE, and hire assistance to implement programs.
- Adopt local codes requiring new water users to utilize water conserving appliances, ie., smaller toilet tanks, etc.
- Meter city use of water.
- Calibrate consumer meters.
- Address water issue in Comprehensive Plan.
- Participate in education programs, ie., schools, bill stuffers, cable T.V.
- Encourage recycling at building permit level for major water users.
- Continue to make city wastewater treatment plant (WWTP) effluent available to the University of Idaho.
- Continue use of WWTP effluent for irrigation at WWTP.
- Establish demonstration projects utilizing low water requirements landscaping parks utilizing low irrigation trees and shrubs.
- Continue 24 hour daily recordings of water levels and pumpage.
- Continue submitting data to the COMMITTEE computer program in timely manner (monthly.)
- Assure the ground water quality is protected in the BASIN by:

Reviewing any project with possible recharge to the aquifers.

Complying with or exceeding State and EPA water quality standards for discharge into streams.

Regulating toxic and hazardous waste storage to create strict standards to prevent contamination of aquifers.

Prohibiting chemical dump site over the aquifers.

Continuing compliance with EPA regulations regarding underground storage tanks.

The following is the action plan of the City of Pullman. It specifically supports the goals of the COMMITTEE as appropriate for this ENTITY, as stated in the PLAN, and as referenced below. In no case is this action plan intended to be in conflict with the PLAN.

#### **COMMITTEE** Goals:

- To provide for future beneficial use of the BASIN ground water without depleting the BASIN aquifers while protecting the quality of the water.
- To promote a program of public education and awareness regarding BASIN ground water management issues.
- To promote careful monitoring and analysis of ground water level and usage data for the BASIN.
- To continue to explore possible supplemental water sources for anticipated and potential future water use in the BASIN.
- To review and make recommendations on all water use or land use applications whose anticipated impact on the ground water system potentially lies outside the stated goals of the PLAN or policies adopted by the member ENTITIES.
- To review and make recommendations relative to the development of an agreement for water transfers across the state line.

In support of the **COMMITTEE** goals and activities, the City of Pullman proposes to:

- Attempt to limit annual aquifer pumping increases to one percent (1.0%) of the pumping volume based on a five (5) year moving average starting with 1986 (827 mgy). At no time shall the accumulated total pumping exceed 125% of the 1981-1985 average (increase from 767 mgy/ to 959 mgy).
- Address water use in City's Comprehensive Plan and Zoning Code.
- Require new development to submit projected water use.
- Enact most stringent code available regarding low flow plumbing fixtures for new construction and remodel building permits.
- Participate in programs that offer users flow restrictors and toilet dams to reduce consumption.
- Consider increasing user rates during summer irrigation periods to discourage wasteful practices.

- Install low water use landscaping at all City facilities and install more efficient irrigation systems.
- Require installation of low water use landscaping on all new commercial and multi-family developments.
- Enact a conservation surcharge on all users with revenues dedicated to educational efforts including **COMMITTEE** sponsored research projects.
- Distribute conservation information through mailings to users, T.V., radio, and newspaper advertisements.
- Construct low irrigation demand landscaping demonstration projects on city owned sites.
- Continue membership in COMMITTEE with funding for studies and research projects.
- Continue input to the COMMITTEE of city's monitoring efforts. Develop usage data by user class ie., residential, single family, multi-family, commercial, institutional, industrial.
- Comply with all State and Federal regulations pertaining to hazardous materials, storm water disposal, solid waste disposal, sewage sludge disposal, non-point source, household contributions, and well construction and abandonment.

#### Latah County Action Plan

The following is the action plan of Latah County. It specifically supports the goals of the COMMITTEE as appropriate for this ENTITY, as stated in the PLAN, and as referenced below. In no case is this action plan intended to be in conflict with the PLAN.

# **COMMITTEE** Goals:

- To provide for future beneficial use of the BASIN ground water without depleting the BASIN aquifers while protecting the quality of the water.
- To promote a program of public education and awareness regarding BASIN ground water management issues.
- To promote careful monitoring and analysis of ground water level and usage data for the BASIN.
- To continue to explore possible supplemental water sources for anticipated and potential future water use in the BASIN.
- To review and make recommendations on all water use or land use applications whose anticipated impact on the ground water system potentially lies outside the stated goals of the PLAN or policies adopted by the member ENTITIES.
- To review and make recommendations relative to the development of an agreement for water transfers across the state line.

In support of the **COMMITTEE** goals and activities, Latah County proposes the following goals apply to all land under the authority of County government:

- Estimate the dispersed/county pumping based on an average per capita use for all county residences both within the BASIN boundaries and for the full county.
- Latah County will attempt to limit annual aquifer pumping increases to one percent (1.0%) of the pumping volume based on a five (5) year moving average starting with 1986 figures. At no time shall the accumulated total pumping exceed 125% of the 1981-1985 average.

Work with the Planning and Building Department to:

 Provide educational brochure with building permits promoting water conservation, low water use landscaping, and general sensitivity to the Pullman-Moscow Aguifer.

- Encourage use of low water volume fixtures. Consider offering a financial incentive for conservation devices at the time of application for permit of new construction.
- Encourage well registration for purposes of data collection.

Establish water conservation policies at all facilities and/or properties managed by Latah County. These policies shall pertain to irrigation practices and physical features of construction.

Refine the county emergency response plan to handle disasters which could affect ground water contamination.

Encourage the development and implementation of water and power conservation programs developed by governmental agencies and private industry.

Endorse and provide funding for water research projects.

Work with the County Cooperative Extension Office and Soil Conservation Service District to develop an outreach program for water quantity and quality education.

Seek assurances of ground water quality in conjunction with solid waste disposal sites. This will include baseline monitoring of present and future solid waste disposal sites.

Regulate development on or the drainage of wetlands not regulated by definition by the Army Corps of Engineers.

Regulate developments which could jeopardize water quality.

Use a land use procedure, for example a "conditional use permit," for developments which propose to use water supplies in the day-to-day operation of a non-residential or commercial venture.

Use the **COMMITTEE** to conduct a preliminary recommendary hearing prior to the above mentioned County proceeding in the case of a land use with a dependence on water use for successful operation of a commercial venture.

Updated Comprehensive Plan will reflect water conservation and protection goals.

Develop a local well-head protection ordinance.

Recognize riparian zones within the County and offer protection through ordinance or conditional use permit review.

Define and support programs for protection of water quality as administered by the North Latah Health District and the state agencies with local authority in this field.

Amend the Zoning Code to require Conditional Use Permits for projects with water impacts.

Apply water protection program standards to the whole county.

# Whitman County Action Plan

The following is the action plan of Whitman County. It specifically supports the goals of the COMMITTEE as appropriate for this ENTITY, as stated in the PLAN, and as referenced below. In no case is this action plan intended to be in conflict with the PLAN.

#### **COMMITTEE** Goals:

- To provide for future beneficial use of the BASIN ground water without depleting the BASIN aquifers while protecting the quality of the water.
- To promote a program of public education and awareness regarding BASIN ground water management issues.
- To promote careful monitoring and analysis of ground water level and usage data for the BASIN.
- To continue to explore possible supplemental water sources for anticipated and potential future water use in the BASIN.
- To review and make recommendations on all water use or land use applications whose anticipated impact on the ground water system potentially lies outside the stated goals of the PLAN or policies adopted by the member ENTITIES.
- To review and make recommendations relative to the development of an agreement for water transfers across the state line.

In support of the **COMMITTEE** goals and activities, Whitman County proposes to:

- Estimate the dispersed county pumping based on an average per capita use for all county residences within the BASIN boundaries. Whitman County Department of Environmental Health will attempt to limit significant pumping increases from the BASIN aquifers.
- Review and, if necessary, amend the county comprehensive plan and zoning policies to address quantity and quality concerns.
- The Whitman County Department of Environmental Health and the Washington State Extension Service office will promote conservation practices and use of water saving devices for <u>all</u> water users (no matter what type of source.)
- Encourage the use of water saving devices for all new construction via hand-outs with the building permit application.
- Continue to encourage all public water purveyors to meter all services within their systems.

- <u>Promote</u> wise landscaping and "water" uses through the use of "best management practices" concepts.
- <u>Support</u> the **COMMITTEE** in pursuing research projects.
- Support the Washington State Department of Health requirements that all new <u>public</u> drinking water wells to install static level measuring devices at the time of pump installation. All <u>existing</u> public drinking water sources, if not already so equipped, will be retrofitted with such a measuring device at the time of pump/hardware removal.
- Support the Washington State Department of Health requirements that pump head measuring and monthly recording of pumping volumes as part of the annual report.
- <u>Support</u> the identification of critical recharge areas within the county.
- Assure that new developments comply with State agency regulations for ground water and surface water protection.

# University of Idaho Action Plan

The following is the action plan of the University of Idaho. It specifically supports the goals of the COMMITTEE as appropriate for this ENTITY, as stated in the PLAN, and as referenced below. In no case is this action plan intended to be in conflict with the PLAN.

#### **COMMITTEE** Goals:

- To provide for future beneficial use of the BASIN ground water without depleting the BASIN aquifers while protecting the quality of the water.
- To promote a program of public education and awareness regarding BASIN ground water management issues.
- To promote careful monitoring and analysis of ground water levels and usage data for the BASIN.
- To continue to explore possible supplemental water sources for anticipated and potential future water use in the BASIN.
- To review and make recommendations on all water use or land use applications whose anticipated impact on the ground water system potentially lies outside the stated goals of the PLAN or policies adopted by the member ENTITIES.
- To review and make recommendations relative to the development of an agreement for water transfers across the state line.

In support of the **COMMITTEE** goals and activities, the University of Idaho proposes to:

- Attempt to limit annual aquifer pumping increases to one percent (1.0%) of the pumping volume based on a five (5) year moving average starting with 1986. This average will begin at 353 mgy plus the new allocation for well #5 of 48 mgy for a total of 401 mgy. At no time shall the accumulated total pumping exceed 125% of the 1981-1985 average. (1981-1985 average is 301 times 125% equals 376 mgy plus 48 mgy from well #5 for a total allocation of 424 mgy.)
- Continue to switch domestic irrigation from wells #3 and #4 to the recycled water irrigation system.
- Submit an application to the State of Idaho for permission to switch water sources for select programs from wells #3 and #4 to well #5 and future shallow wells.
- Continue to install best available conservation technology in new facilities and building remodels.

- Increase recharge through infiltration via land application of stream runoff and recycled water at various places around the University of Idaho campus.
- In selected areas of campus, provide demonstration sites for research and testing of xerophytic grasses, shrubs, flowers, and other landscaping which require less water.
- Financially support the **COMMITTEE'S** educational efforts.
- Supplement the COMMITTEE's educational program with distribution of appropriate information on campus water use and conservation.
- Make public all successful University of Idaho water conservation demonstration projects which can be copied by the public or other ENTITIES.
- Continue to supply **COMMITTEE** with monthly data on ground water pumping and recycled water irrigation volumes.
- Comply with all State and Federal regulations pertaining to hazardous materials, storm water disposal, solid waste disposal, sewage sludge disposal, non-point sources, and well construction and abandonment.

# Washington State University Action Plan

The following is the action plan of Washington State University. It specifically supports the goals of the COMMITTEE as appropriate for this ENTITY, as stated in the PLAN, and as referenced below. In no case is this action plan intended to be in conflict with the PLAN.

#### **COMMITTEE** Goals:

- To provide for future beneficial use of the BASIN ground water without depleting the BASIN aquifers while protecting the quality of the water.
- To promote a program of public education and awareness regarding BASIN ground water management issues.
- To promote careful monitoring and analysis of ground water level and usage data for the BASIN.
- To continue to explore possible supplemental water sources for anticipated and potential future water use in the BASIN.
- To review and make recommendations on all water use or land use applications whose anticipated impact on the ground water system potentially lies outside the stated goals of the PLAN or policies adopted by the member ENTITIES.
- To review and make recommendations relative to the development of an agreement for water transfers across the state line.

In support of the **COMMITTEE** goals and activities, Washington State University proposes to:

- Attempt to limit annual aquifer pumping increases to one percent (1.0%) of the pumping volume based on a five (5) year moving average starting with 1986 (642 mgy). At no time shall the accumulated total pumping exceed 125% of the 1981-1985 average (increase from 702 to 877 mgy).
- Convert irrigation to computer controlled automatic systems on 70-90% of all turf within 10 years.
- Eliminate 20 GPM of cooling water to the drain within three years.
- Financially support the **COMMITTEE** activity.
- Install water meters on its major water users.
- Supplement the COMMITTEE's educational program with distribution of appropriate information on campus.

- Report all appropriate water data to the COMMITTEE for analysis.
- Set a goal of no increase in withdrawal rate for the next two years to test the MODEL with actual data.
- Protect the ground water quality by:

Maintaining good landscape practices and reviewing chemical use.

Monitoring and/or eliminating all underground storage tanks containing chemicals.

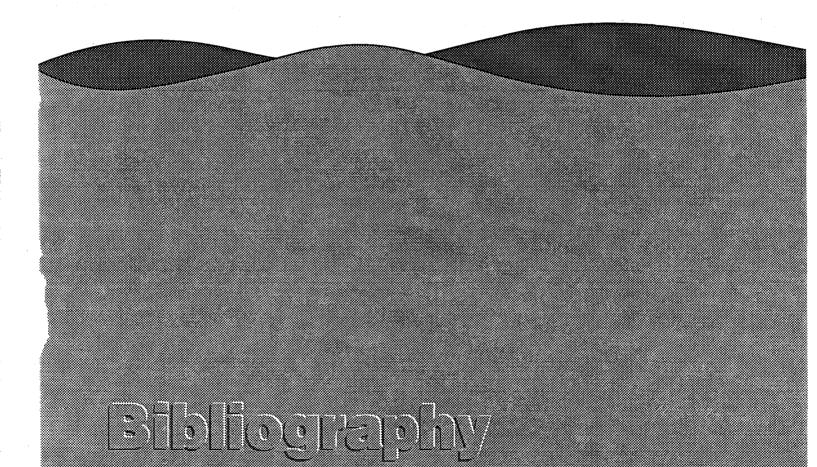
Continued monitoring of the old hazardous waste site.

Monitoring sewer systems and correcting any deficiencies (leaks, cross connections, etc.) noted.

Monitoring existing septic tank systems and properly siting future systems.

Insuring that proper well construction procedures are followed.

Complying with all State and Federal regulations pertaining to ground water and surface water quality.



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# Appendit 1. Literovennicht Agleinent

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		[H. 그리 바다 - H.		
		나이 얼마를 가득하게 하고 말았다니다. 그 이 없다.		보고 있다는 선생님이 있었습니다. 그렇게 되었습니다. 그 나는 그리고 있다.
			어린이 사람이 되고 하느라 얼마를 다 했다.	이렇다 시들이 어디를 받는 것이 그런 보다
		교육에 하고 있는 경험을 하고 있다면 하다.		이번 이번 경기 이 호텔이 그리고 있는 그래픽 이다.
		호기하는 1. 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	왕이 살아가게 잃었는데이 맛있었다.	
		지나 병하는 사람이 되어 되었다면서	되는 사람들이 아이를 모든 살아왔다. 그는	
				설립: 경기 : 1 : 1 : 1 : 1 : 1 : 1 : 1 : 1 : 1 :
		요즘 보다 사람들은 사람들은 이 집에 하는 이용		
하는 회사 회사 개념을 하는다.			어느 그리 회 및 어느, 나를 받아	고급적인 수가 가지를 잃었다. 하는 사람들은 나는
		하네요. 아니 얼룩됐다면 하는데 이 성택다	요즘 경기 시간이 시작되는 것이 되었다.	
그 기가 있는 사람이 없다.		수 집에 하는 하나요? 그는 지수 없는 이 그는 없다.	회원은 이번 살림 사람이 다시다.	엄마 그렇게 되는 하지 하고 있는 것을 가게 되었다.
		성당에 그 그러워 이렇게 하셨어요? 그 사이를	그 남자는 항속에 하지 않는다고 살았다.	된 하시 점점 바꾸다고 하는 데 모든 경험하게 되었다.
		물에 어땠다면 이 이 글날이 되면 하다고요?	그는 이 기상하는 기를 받는데 많은 이번 나기	"我们就是要到了这种的我们,这是她们的一定是一个
		그리고 살아가지 아이는 사람들이 가져가 있다.		그렇게 이번 없는 그를 잃는 그를 하는 것이다.
		. 그리 속이 먹다 이름을 가 하면요 ~		
	Day Audi 1995	이 일본 시간 선생님이 이번 이번 이번 가고 있다.		
그 문제로 최어 교회가 되었다.		그리 이 하는 가는 네이스 생산으로 밝혔다.	맞짝임 글이 낡아이라는 이 회사와 그래?	
민준이 집에 가는 아이네요?			아는 아들 가게 되었다. 그런 그리를 가고 하는	
[17] 우리 공원 : 4도 전기			이 문화를 들어가는 말하게 하다.	일찍 이 교통 경험과 학교 생활을 하는 것이 되다.
				그러지, 그 사이 본 경험 회사 연락하다. 것
	e di Agelia	문화장이 어디를 가게 되었다. 그들이 아니다.	[발생님이] 크림(() 전 [발생] (캠프리스)	그 집에 하면 그는 얼굴하다. 이 네이트 그릇이 먹다
		하다 하는 사람들은 하는 원래를 가장 하셨다.	요하는 사람이 하게 되는 눈을 모았습니다. 없다	요즘 이 경기가 있을까요? 그 아니라 이 그리
		医含质性 医乳酸盐 电影机会员的人		
		과는 얼마로 하는 사람이 살려가 되었다.		수 가지를 걸게 한 사람이 그 있어요.
			링 하이지 않는데 [12] [14] [16] - 17	
	de Ostado Augar	하는 이글로 맞으는 아이들은 이 그리고 있었다.	[[시작 : 40개를 보고 말이 되는 말했다. [] [[	요즘 이렇게 하는 물로 이 별 건물하는 이 모양을 했다.
		보이라는 희망하다 않아 보다 하다는 사람이 다른생태는	일은 이 이번에 가득되었습니다. 개월입니다.	
		그 이 문에 다른 바람들이 그는 동안 부모다.	현생님은 내는 그리는 병에 너무 얼마나왔다.	왕석이 되고요? 보는 건물병에 없는데 다
		보급하였다. 이 그 회문을 불빛으면 본 나라보다.	이 이 기는 맛이다. 너무나 그는 말 함수 없다	생활을 모양하게 하기를 하는 사람이 모르는데 다
		기계 교육의 시험 중에서 하는 기를 받는다.		시작하다 이렇게 다른 아이에 나는 아이는
아이들의 한 생활하고 있다. 그	그 교회 기계했다.	맛있으로 큰목하다 하시다는 맛있는 병원은 사람이다.	네트 이 사이 만든 나는 강 점점점점	
		이어 기술 중에게 그렇게 그렇게 있는데 살이다.		이 등은 그리는 그들을 가게 된 것 같다.
		크림은 전기가 있는 경기를 들다고 이동화	경영 (1987년 - 1987년) - 198 <b>년</b> -	
		納納 化动物性电影 建氯苯酚 医克拉氏菌素		그는 병사 얼굴이 그 가장이 된 그 불편하다.
	tik pri jedan jedan je			
		이 집에도 그는 이 그 사람들에 가지를 챙겨놓다		
		나는 아이가 그는 아니까 얼굴하는 때 다니다.		사람이 그 나는 이 얼마 하나요?
			그리고 실하는 형태를 받아 되었다.	\$P\$ 15. 自然是一种 15. 性感素,是45. 是多种。在1
			그 사는 하는 명 관련들이 하고요.	레 인공화는 남편이 아이트웨다하다
				30.4.4.5.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1
			가는 이 없이 가장 많이 살았다.	
		그렇게 얼마나 그를 하는데 보다 다니?		
	이 맛이 살았다면	화장 등이 되는 것 하늘이 되면 이렇게 하셨다.	지원 경우의 기가 문학생활절이	De 연락자 - 연설되었는 연원에도 하는 모든
			복하하면 이 위한 이 기원보기 가입니다.	그리는 살아도 생활을 만난 것으로 하는 것이다.

#### APPENDIX A

#### INTERGOVERNMENTAL AGREEMENT

(Pullman-Moscow Water Resources Committee)

THIS AGREEMENT is entered into by the City of Pullman, Washington; the City of Moscow, Idaho; the County of Whitman, Washington; the County of Latah, Idaho; the University of Idaho; and Washington State University (hereinafter sometimes referred to as the Entities) to be effective the first day of August, 1988 or as soon thereafter as the requirements set forth in Paragraph XIV are accomplished.

#### WITNESSETH:

WHEREAS, the water supply in Latah County, Idaho, and Whitman County, Washington, is an important regional concern; and,

WHEREAS, the City of Pullman, Washington; the City of Moscow, Idaho; the County of Whitman, Washington; the County of Latah, Idaho; the University of Idaho; and Washington State University deem it in the public interest to work jointly and cooperatively on water resource problems and issues; and,

WHEREAS, the Entities are authorized to enter into and carry out this Intergovernmental Agreement pursuant to the provisions of Idaho Code Sections 67-2326 et. seq., and Chapter 39.34 of the Revised Code of Washington; now, therefore

# IT IS HEREBY AGREED by and between the Entities as follows:

- I. Committee Established: In order to carry out the purposes established in this Agreement, the Entitles hereby agree to the establishment of a committee to be known as the Pullman-Moscow Water Resources Committee (PMWRC).
- II. Membership: The PMWRC shall consist of twelve appointed members with two members each representing the following Entitles: the City of Pullman, Washington; the City of Moscow, Idaho; the County of Whitman, Washington; the County of Latah, Idaho; the University of Idaho; and Washington State University. Each member shall serve at the pleasure of the Entity which appoints that member for a term of two years with the 1st term beginning on August 1, 1988.

# III. Purpose: The purposes of this Agreement are to:

- (A) coordinate planning to assure a long-range supply of water to the entities;
- (B) retain the momentum and continue to update and expand the database already begun through previous studies;
- (C) encourage conservation to promote the life of the aquifer serving the Entities;
- (D) investigate continuing and/or alternate sources of water;
- (E) educate and advise the entities on the quantity and quality of the public water supply for the water basin serving the Cities of Moscow, Pullman, and the surrounding area;
- (F) act as liaison between the Entities on water resource concerns; and
- (G) promote communication between the Entities, the Washington Department of Ecology, and the Idaho Department of Water Resources.

# IV. Powers: The PMWRC shall have the power to:

- (A) collect and disseminate statistics and other information;
- (B) allocate expenditures of funds contributed by the Entities;
- (C) designate one of the Entities as a depository for funds and for the administration of those funds;
- (D) hire personnel (by written agreements setting forth all duties and compensation) who will serve at the pleasure of, and whose duties will be determined by, the PMWRC;
- (E) enter into legal and financial agreements, but only after any such agreements have been reviewed and approved by the Entities;
- (F) apply for and administer grants; and
- (G) work with the Entities in educating the public.

#### V. Officers and Voting:

- (A) One member shall serve as Chairperson, one member shall serve as Vice Chairperson, and one member shall serve as Secretary. One member may serve as Treasurer and this office may be combined with the office of Secretary if the PMWRC so chooses.
- (B) Each member of the PMWRC shall have one (1) vote. In the event of a tie vote, the issue shall fail.
- (C) Entities may select alternate members in a manner considered appropriate by the selecting Entity. In the event that an appointed member of the PMWRC will be unable to attend a meeting of the PMWRC, the Entity represented by that appointed member may be represented by that appointed member. Alternate members representing absent appointed members shall have the same privileges as appointed members; provided, however, that no Entity shall have more than two votes on the business coming before the PMWRC.

# VI. Meetings and Election of Officers:

- (A) The PMWRC shall hold meetings at such times and places as set forth in its by-laws.
- (B) The PMWRC shall annually elect its officers as set forth in its by-laws.
- (C) The quorum necessary for the PMWRC to transact business or elect officers shall be constituted when seven members or a majority of the members representing the Entities entitled to vote in accordance with the provisions of Paragraph VII (D) are present at the meeting.

# VII. Financing:

- (A) Annually the PMWRC shall establish a budget for the ensuing operating year, which budget shall be established in sufficient time to allow each Entity to budget its contribution for the ensuing operating year.
- (B) Contributions are due and payable from each entity with one half of the amount due on July 1st and the remaining one half on January 1st of the following year of each year of this Agreement. The funding ratio for contributions for administration and projects which uniformly impact all Entities shall be as follows:

The University of Idaho, Washington State University, the City of Moscow, and the City of Pullman, shall each, as its contribution, pay twenty (20) percent of the operating budget of the PMWRC;

The County of Latah and the County of Whitman shall each be responsible for ten (10) percent of the operating budget of the PMWRC.

- (C) This funding ratio may be altered for the funding of specific projects according to the interests and benefits of each participating entity. Altered funding ratios shall be approved by each Entity participating in the altered funding ratio.
- (D) Any Entity not current in the payment of a contribution shall lose all voting rights until such time as that Entity is current in contributions for that operating year.
- VIII. Duration: This Agreement shall have a term of ten years from and after August 1, 1988, unless the PMWRC is sooner dissolved as set forth in Paragraph XI (A).
  - IX. Annual Report: The PMWRC shall report on its activities to each Entity on an annual basis.
    - X. By-Laws: The PMWRC may adopt, amend or repeal by-laws, in whole or in part which are not inconsistent with the terms and conditions of this Agreement, by a majority vote at any regular or special meeting of the PMWRC. A majority vote for the purposes of adopting, amending or repealing by-laws means a majority of all members of the PMWRC qualified to vote in accordance with the provisions of Paragraph VII (D) and not a majority of a quorum.
  - XI. Dissolution and Disbursement of Funds and Property:
    - (A) Any Entity may automatically withdraw from the PMWRC by submitting a written statement setting forth its intent to withdraw to the remaining Entities at least sixty (60) days prior to the effective date of its withdrawal.
    - (B) The PMWRC shall be dissolved through a written agreement approved by a majority of the Entities or through the withdrawal of three of the participating Entities.
    - (C) Any surplus funds or property remaining at the time of dissolution shall be distributed to the Entities in the proportion to the amount of money each Entity had contributed to the PMWRC budget during the one-year period (365 days) prior to the dissolution. If it is impossible to distribute such property, it shall be sold as surplus property of auctioned off with the proceeds disbursed as set forth in this Paragraph (C).
  - XII. Real Property: The PMWRC may neither acquire nor hold real property.
- XIII. Expenditures: The disbursement of funds contributed by the Entities and received from other sources shall be managed by one of the Entities to be designated by the PMWRC which may, from time to time, be changed by a majority vote of all Entities participating in the membership of the

PMWRC qualified to vote in accordance with the provisions of Paragraph VII (D) and not a majority of a quorum.

- XIV. Filing and Effective Date: Copies of this Agreement shall be filed with the Pullman City Clerk, Whitman County Auditor, the Secretary of State of the State of Washington, the Moscow City Clerk, the Latah County Auditor, and the Secretary of State of the State of Idaho prior to its entry into force. This Agreement shall be effective upon execution by the Entities and the accomplishment of all filing requirements as provided herein subject to the approval of the Secretary of State for the State of Idaho as provided for in Section 67-2329 Idaho Code.
- XV. Repealer: As between the City of Pullman; the City of Moscow; the County of Whitman, Washington; and the County of Latah, Idaho; all earlier agreements between them relating to water supply and the Pullman-Moscow Water Resources Committee that have not already terminated by the passage of time or the completion of their purpose(s) are hereby revoked and terminated, and specifically the following inter-local agreements shall be automatically terminated on the effective date of this Agreement, to-wit:
  - (A) Agreement for Engineering Services Water Supply Study Pullman-Moscow Water Resources Committee.

Dated:

January 15, 1970

Signatories: City of Pullman

City of Moscow University of Idaho

Washington State University Stevens, Thompson & Runyan, Inc.

(B) An Agreement Relating to a Water Study for Pullman-Moscow Region.

Dated:

February 11, 1970

Signatories: Washington State University

University of Idaho City of Pullman City of Moscow

(C) An Agreement Relating to the Pullman-Moscow Water Resources Committee.

Dated:

October 30, 1972

Signatories: Washington State University

University of Idaho City of Pullman City of Moscow

(D) An Agreement Relating to the Pullman-Moscow Water Resources Committee.

Dated:

July 11, 1974

Signatories: City of Pullman

City of Moscow University of Idaho

Washington State University

Contractual Agreement between the City of Pullman, acting for the (E) Pullman-Moscow Water Resources Committee and Washington State University on behalf of the College of Engineering.

Dated:

August 13, 1974

Signatories: The City of Pullman acting for the Moscow-Pullman

Water Resources Committee Washington State University

(F) An Agreement Relating to the Pullman-Moscow Water Resources Committee (Study of aquifer serving Pullman/Moscow area).

Dated:

January 30, 1985

Signatories: City of Pullman

City of Moscow University of Idaho

Washington State University

IN WITNESS WHEREOF, the parties to this Agreement have caused it to be executed to be effective the day and year first set forth above, and each signatory represents that he or she is authorized to sign this Agreement.

CITY OF PULL	AN. WA	SHIN	GTON
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CITY OF MOSCOW, IDAHO

<u>/s/ Carole A. Helm</u> Mayor	<u>/s/ Gary Scott</u> Mayor
ATTEST:	ATTEST:
/s/ John Tonkovich Financial Director	<u>/s/ Elaine Russell</u> Clerk
WHITMAN COUNTY, WASHINGTON	LATAH COUNTY, IDAHO
<u>/s/ Dan Boone</u> Commissioner	<u>/s/ Tom Spangler</u> Commissioner
/s/ James Hanning Commissioner	/s/ <u>Laverne Nelson</u> Commissioner
/s/ John Henley, Jr.	/s/ Nancy Johansen

WASHINGTON STATE UNIVERSITY

UNIVERSITY OF IDAHO

/s/ G.A. Hartford
Title: Vice President - Business
and Finance

/s/ Joe Geiger Title: Financial Vice President

Approved as to Form:

/s/ Jon R. Harlan
City Attorney of Pullman

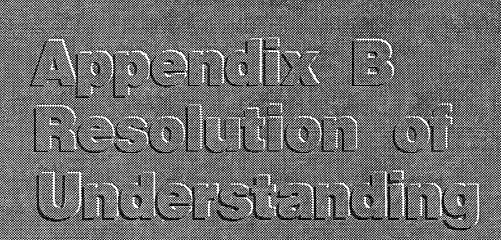
/s/ William L. Herrington
City Attorney of Moscow

/s/ Jim Kaufman
Whitman County Prosecuting
Attorney

/s/ Craig Mosman
Latah County Prosecuting Attorney

/s/ Sally Savage
Assistant Attorney General
Representing Washington
State University

<u>/s/ Jon Warren</u>
Attorney for the Regents of the University of Idaho



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그렇게 되었다는 그렇게 함께 하지 않다.			表了"\$P\$一片新来。"苏雪的		
그는 사람들 전빛 그리고 얼마나다		[16] - 이렇게 됐다고 그 그 ㅋ	되어졌더니 생물이 되었는데 있다.	r i de la companya da la companya d	
	백 1개 글로 살 시시 교육장	는 셔팅되었다. 그리고 하는		네트 그 그렇게 얼마 마셨을까요?	
				선생님들의 전에 가는 사람이 되었다.	
The state of the s					
		계획성 - 기계적 기계 기	후에 보면서 이 생각들의		
				맛졌다면요 그렇게 얼마나 뭐 가능된	
	생기들의 그 경소 경기에서				
	등 경기 보는 기계 강한 경기를	레 년대 관련 시간 아버지			
	원정성 그 그렇게 하셨다.			아름이 그렇게 느껴~^^~~	
그러나 나는 눈이 들었다면서?					
	[일시 시민들 교육] 이 경화				
		강경화 기민은 제공다.		불편하였다. 그들 하늘 경기는	
		등 다시 그는 아이지 않다.		하인성으로써 이번 경험된 함께되어.	
그 이 그렇게 걸렸다는 그리는 그림은				반에 되어 되었었다. 생각 말았다	
그렇다 보다하다 보다 하다. 그			왕이다고 하는 얼마나요.		
그리아 맞았다 요요 그리고 하는 그리는 그리	회사 이 지시 그렇게 되었다.				
그냥 잃었다. 그렇게 말이 말하였다.		기대가 하고 이렇게 가게 되었다.			
	보는 그 그리고 이번을 되었다.	가는 사람들이 되었다. 그런 이 바람들은 기술을 다 했다. 	하게 하는 사람들이 얼마를 하는	강마리 바람이 불통하는 그 중심하다	
그림 나무 주세 하지만 하고 하다.		이 저는 오늘 밤일으로 깨워들은			
		요즘 사람이 하셨습니다. 함께 하	그는 젊은 경고를 가능한 점점		
		그렇게 모르는 이 사람들하다면			
			병하면서 그렇게 되었습니다.		
그 뒤를 하는 그 있었다. 이 생생이		다양이 보답하고 싶으네요.	그 이렇게 됐는데 얼마나라 얼마	그 전쟁인 사람이 사용하고 뭐하게 되다	
이러 하시 하시나 얼마나 아름다니다.		용하는 다른 그렇게 이 생활하	리아이 얼룩하다 하는 아니다.	오 첫 이탈하다 모르게 다하는데 수	
	사이 이유를 잃었다면서 그			경기 회사가 된 경험되는 보다	
	그 그리다 왕이 빨갛지다.		나를 잃었다.	교 기계되지 않겠다면 휴 프로그	
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그들은 아는 눈물통을 통점하고 하는 이름이		경기 보고 존중하는데			
나는 사람들은 얼마 속이 되다.		사람들 이 경기 없었다.		오타고 있다면 현대들이 모여 다	
그 이 맛 있을데 하다 남편하는 이다.					
				지근 맛이는 동생들이 하하는 하다.	机化物信息压缩
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그 그는 속살이 사용되는 것이 되었다.					
	그는 회사를 하네요.				

#### APPENDIX B

## RESOLUTION OF UNDERSTANDING between PULLMAN-MOSCOW WATER RESOURCES COMMITTEE IDAHO DEPARTMENT OF WATER RESOURCES WASHINGTON DEPARTMENT OF ECOLOGY 1989

WHEREAS, the Pullman-Moscow Water Resources Committee composed of representatives of Pullman, Moscow, University of Idaho, Washington State University, Whitman County and Latah County has an interest in the protection and management of the ground water resources of the Pullman-Moscow basin; and

WHEREAS, the Idaho Department of Water Resources and Washington Department of Ecology have the legal authority and the technical expertise to administer and regulate water law in their respective states, and the responsibility and desire to participate and assist in the management of the ground water resources; and

WHEREAS, there is evidence to show that the potential exists for the overuse of quality ground water resources within the basin; and

WHEREAS, a ground water management plan developed and implemented in concert with public needs and interests and in accordance with state and local laws, rules and regulations can serve to avert the overuse of the ground water resources in the basin; and

WHEREAS, the parties to this Resolution are desirous of developing and implementing such a ground water management plan; and

WHEREAS, the parties hereto are authorized to enter into this Resolution of Understanding for the purposes stated herein.

NOW, THEREFORE BE IT RESOLVED that the parties to this Resolution do agree to the following:

The Idaho Department of Water Resources (IDWR) and Washington Department of Ecology (WDE) agree to commit sufficient staff time to assist in the completion of such tasks as may be appropriate. IDWR and WDE further agree to pursue the implementation of a coordinated Washington-Idaho ground water management plan for the Pullman-Moscow basin in accordance with their respective state law policies.

The Pullman-Moscow Water Resources Committee (PMWRC) agrees to work with the state agencies and to serve as the forum for input from local governments, interest groups and private citizens.

Specific obligations of the Committee are as follows:

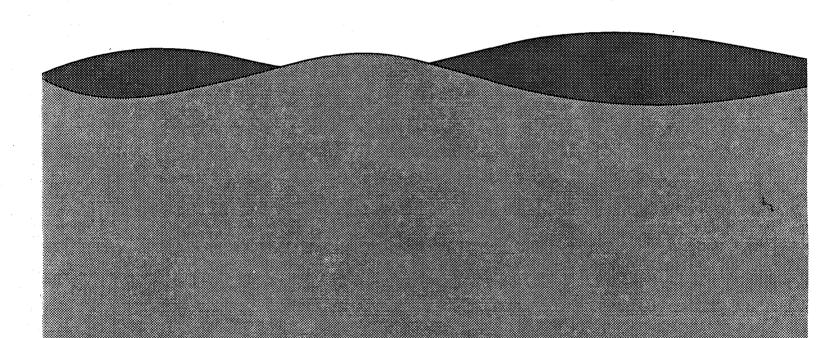
Appendix B, Page 1

- 1. PMWRC will pursue and administer funding to conduct and promote studies and research relative to improving knowledge of the water resources of the basin.
- 2. PMWRC will prepare a management plan for the basin in cooperation with the two state agency parties (IDWR and WDE), which will address both water quantity and water quality concerns.
- 3. PMWRC will prepare as an initial step in the development of the management plan a principal work plan and time schedule which will outline the concerns and issues to be studied. This work plan shall indicate the party or parties with responsibilities for each task and an estimated schedule for completion of each task.
- 4. PMWRC will encourage public involvement in the development of the water management plan through public hearings and education programs.
- 5. PMWRC will facilitate the implementation of the ground water management plan in concert with the member entities of the Committee.

BE IT FURTHER RESOLVED, this Resolution shall be effective upon execution by all parties and accomplishment of the filing requirements and approvals as may be necessary. This Resolution shall remain in effect until the completion of the ground water management plan or until any party to the agreement terminates its participation by written notice of termination to the other parties.

This Resolution can be amended at any time by written notice to all parties, except that action by the Committee at a regularly scheduled meeting and notice to IDWR and WDE shall satisfy the written notice for PMWRC or Committee members.

<u>/s/ Carole Helm 5-30-89</u>	<u>/s/ Mardi Baron 5-30-89</u>
Pullman Date	Moscow Date
/s/ Kenneth E. Abbey 5-30-89 Washington State Date University	<u>/s/ Joseph Geiger 5-30-89</u> University of Idaho Date
/s/ John Henley 5-30-89	/s/ Nancy Johansen 5-30-89
Whitman County Date	Latah County Date
/s/ Fred Olsen 5-30-89 Washington Department Date of Ecology	<u>/s/ Wayne Haas 5-30-89</u> Idaho Water Resources Date



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한 경기를 잃었다면 사람들이 다음이 얼굴하는	나는 경기 가장을 되었다. 그림으로 그리다.	그 아이들의 가하고 생각하네요요. 없었다.	
	원은 여러가 나와 노하게 돌아가지 들었다고?	그러면 있어요요요 사람이 모드다고요.	된 그 경기 보통회의 환경생활 가게
이 경기 중에 가게 걸린 듯하겠다면 하는 것 같다.		나라도 그렇게 다꾸 하다고 말했는데 나를 다.	
이 마시스 아이들은 남편 사는 제 그렇게	그런 그의 시험 등록하는 이번에 작 되었.	물리 하기 지만하는 말을 보고 하는 목을 걸려.	물리에 많아 있는데 회사를 가득하다고
이 아이 씨는 이 그들까지 하셨다면 하는 모든 것은		하다 거불에게 한 성동을 통했다. 함께 함께 다	
		원 기업에 인생하는 강화가 얼마다. 기업 - 1000년 2000년 - 1000년	

#### APPENDIX C

#### PUBLIC INPUT

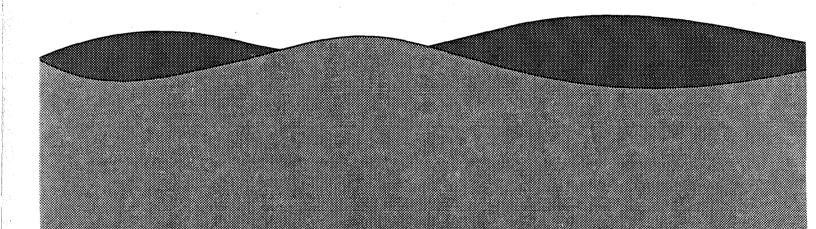
In October of 1989 a community workshop was held in Pullman to allow public participation in the identification of ground water concerns and their possible solutions. The workshop was beneficial in that it allowed people in the Pullman-Moscow area to voice concerns and suggestions and to become better informed on the BASIN ground water problems or issues. From the workshop, it became apparent that:

- 1. community people do want to become involved in BASIN ground water issues,
- 2. the public is in need of more information regarding the BASIN ground water system, and,
- 3. the public is in favor of water conservation in the BASIN.

Community participation in the **PLAN** development and adoption will be furthered through public input via the member entities, another community workshop, and a public hearing.

The second public workshop was held on October 10, 1991 in Moscow, Idaho. After brief comments from officials of the Idaho Department of Water Resources and the Washington Department of Ecology, the group was requested to consider two questions: 1) your assessment of actions proposed for your area and 2) how citizens involvement can be developed. Six groups were then formed to consider these questions in relation to each of the six entities. Revisions in the action plans of the entities resulted from these discussions.

The final public hearing was held on March 25, 1992 in Moscow, Idaho. There were no changes suggested to the **PLAN**. Idaho Department of Water Resources and Washington Department of Ecology officials announced that they were developing an interagency agreement under which the **PLAN** would be administered. A copy of the agreement is included as Appendix F of the **PLAN**.



APPENDE D Sugested Resealch

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그는 그 동일을 하고 않았다. 그들은 그들은 바다 하는 사람들이 그는	
그렇게 당점 높이 얼굴됐다는 이 다른 어떤 것을 만든 다른 점점	아이트를 하얗게 되는 사람이 살아 바라는 하는 맛이 됐다. 하나 살이 아이는 사람이 있다.
그림생물은 하고 왕이 그는 양을 이어 없을 내었다.	요즘 흥미 시간 전체 얼굴하면 이 시간에 된 모양하는 이 보였다는 맛없다고 하시네요?
요즘 살아가고 살아 그 노력이 하는 것이 어떻는 때까지	일 더 의 집 이 시간지 마음에 내 그녀지 않는 사이지 않는다. 사람들은 바라 하는 나는
	물속이면 보고 있는데 하는 지금 없다면서 생각 중에 살았다. 이 이 이 이 나를 내는 나는
그릇 등 물리가 하고 보고를 보는 하면 그 사람이 되었다.	보이지를 지어야 하는 물건값 프로젝트 그런 이를 보기를 하는 이번 하게 하다. 그램 모모
그렇게 되어 있다. 어림 얼마 하는 어린 사람이 없다.	강하고 있는데 말이 있는 돈 이 그들에 다르게 된다. 뭐라는 이 사랑은 그 본지를 했는다고 모다
나는 어느 누워 한잔을 바꾸었다. 이 생각 아들는 사람	그런 그 걸으라요 보는 어느까 만나는 이 생긴에 그렇고 말으면 보고 이 흔들렸다. 이
	대경인성 싫으러 내려보는 근행 중요를 보고 말했다. 경에의 내민 말다면 많이 다니
	가는 사람들은 사람들이 되었다. 그 사람들은 사람들이 되었다. 그런 사람들은 사람들이 되었다. 그는 사람들이 되는 사람들이 되었다. 그는 사람들이 되었다. 그 사람들은 사람들이 가장 사람들이 되었다. 그는 사람들이 되었다. 그런 사람들이 가장 사람들이 되었다. 그는 사람들이 되었다. 그는 사람들이 되었다.
	하는데 보고 있는 나를 하는 하늘이 가득하다는 그를 하는 사람들이 되는 물리를 하는데 되었다.
	그런 이 보이는 그들은 동안하다면 모든 경우를 받는데 그 나는 하는데 모든 하는데 되었다.
하는 이 가는 점심이 그렇게 되어 이렇게 놓아요	요즘 보이다 그 아픈 물이 이번 바로 이 이 이 사람들이 모르겠다면 모르게 되었다. 그 그
그녀가 하는 이 그 하다. 소리는 그 그림이 쫓	결과 보다 있는 것들을 보러 받는 것도 그는 전 한 분세 있다고 하루르고 하는 말을 받는다.
그렇지 하는 물을 때 중요요요 그들도 비리다	보고 있는데 그는 하는 그들이 아무리가요 그 이 것은 동생님은 그리고 그리고 가장이 아내왔다. 그
기계에 하고 보고 있다는 그렇게 되는 그 없어?	얼마 중에 불살이 있다. 하는 사람들은 그릇이 한다. 나는 이 사람들은 그래도 하는데
	등학 당시 시민 그리스를 보고 말까지는 깨끗하는 하당이 되고 있다. 그 그 아름이 없는데 그
그런 하는 물에 보다는 그렇을 생활이 가득했다. 없네	[조조리] [1] 전 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
임의 상취 가는 제상한 회에 되는 모양되는 것	그는 그렇게 하는 사람은 사람들을 하는 사이는 것이 한다는 것 같아 이 분들이다.
일을 하는 사람들은 경기를 받는 것이다.	
기계 있어요. 구현 방송에 가장 생산인 항송 변형에게	불길이 생겼으로 가 하고요요. 그는 그리는 바람들은 걸을 하고 있는데 하기 없다.
	결과 이어방을 들어 보고 있다면 역 한 여자를 살을 시스다면 하는데 모르다는
그 병과의 학생들은 그런 사람들은 사람들이 되는 것이다.	왕이고 나가게 돌면하고 하셨다겠지 않고 하나 돌면하면 그 물을 보여. 나 있어 다시다
그는 그리고 되고 있는 경기 눈볶음을 다고 말했	이 보이는 사람들은 살림이 되었다면 하다 하는 것 같은 사람들이 되는 사람들이 되는
	됐지요 하지도 본 경찰을 어느로 올린 레스스 그들도 자연스로 하다 어떻게 되다.
그런 하고 있는 말까지 그리고 그리고 하네. 그래	캠프 그는 그 사이를 보다 일반 말은 그리고 있는데 하는 바람들이 모든 그들이 나는 이 아니
그 회원에 살아 그 말라면 하는 아이스 왕이 남인 나를	내린 그는 얼마를 전환하는 그 아이를 가면 가면 그리고 있다면 하는 그를 하는 것이다.
Bull 인류는 이번 : 원호 한 18 18 18 18 18 18 18	그래 되는 그는 전에 되어 그리고 살아보니? 이렇게 하게 하면 사고를 취고하는데 이번 하다.
	가른 골목 보다 보는 사람이 호텔하고 있다. 그렇게 하는데 그래 없었다. 그 모든 다.
이 하는데 이번 그렇는 사람들이 얼마를 느껴들어 되었다.	번째 (1. 2. 14 - 1. 15 - 1. 15 - 1. 15 - 1. 15 - 1. 15 - 1. 15 - 1. 15 - 1. 15 - 1. 15 - 1. 15 - 1. 15 - 1. 15 -
	[4] [1] [1] [4] [2] [4] [4] [4] [4] [4] [4] [4] [4] [4] [4
(보고), 보고 있는 하다는 그는 그리고 살려면 낡아?	돌통에 대한 지신 교통하는 대학생 호망 선생들이 다 전략하여 다고 들어가 있다.
	그렇게 그리고 중 마켓 집에 들고 된 이 흙된 이 그리고 한쪽으면 말리는데 하나 그 모든
	그렇다 그는 이 그는 이 전환을 가지 않는 것이다. 그런 그런 바다 하는 것이다. 나는 사람
	그 희망수 하는 그 모양이 되는 그리는 것은 이 무슨 그 무리는 경기를 받는 것이다.

#### APPENDIX D

#### SUGGESTED RESEARCH

Areas of research that will aid effective management of the BASIN are outlined below:

- 1. Field investigations
  - a. Geologic studies;
  - b. Flow path and flow time studies;
  - c. Soil percolation (lysimeter) studies;
  - d. Studies of the recharge from (or discharge to) streams in the BASIN;
  - e. BASIN discharge to streams and rivers in the BASIN and seepage to the Snake River canyon;
  - f. Artificial recharge using recharge ponds or reservoirs and recharge wells; and
  - 9. Soil recharge enhancement and erosion reduction studies;

#### 2. Model studies

- a. Acquisition of a computer ground water MODEL; for convenient use by the COMMITTEE and ENTITIES;
- b. Study of the sensitivity of MODEL output to MODEL input, particularly in areas where relatively large uncertainties exist in the input data;
- c. update and upgrade the MODEL as appropriate to accommodate updated input information or changing computational or output needs; and
- d. use the MODEL to evaluate alternative management strategies or scenarios.

#### 3. Feasibility studies

- a. Conservation, re-use, and recycling methods;
- b. Alternative surface water sources, including water storage within the BASIN and water transfers from outside the BASIN:
- c. Inter-entity water transfers;

Appendix D, Page 1

- d. Alternative ground water sources;
- e. Split uses of upper and lower aquifers water; and,
- f. Dual water systems for irrigation with lower quality water.

## Appendix E Commission Expresentatives

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#### APPENDIX E

#### **COMMITTEE REPRESENTATIVES**

(1990 - 1991)

#### **Pullman**

Jim Hudak, Director of Public Works, City of Pullman Craig Ward, City Council AL Halvorson, City Council (from 1989 to January 1991) Louie Sauer, City Council (from February 1991 to present)

#### Moscow

Gary Presol, City Engineer, City of Moscow Mardi Baron, City Council

#### Whitman County

Maggie McGreevy, County Commissioner Jim Nebel, County Health Department

#### Latah County

Pam Peterson, County Planner Nancy Johansen, County Commissioner

#### Washington State University

Joe Spoonemore, Director, Physical Plant Ken Abbey, Assistant Vice President, Business (from 1988 to September 1990) Craig Benjamin, Energy Manager, Physical Plant (from October 1990 to present)

#### University of Idaho

Kenneth A. Hall, Director, Facilities Management Larry Kirkland, Energy Engineer, Facilities Management

# Appendix F Resolution to Adopt Interagency Agreentic

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그리고 말하는 생생님이 아이는 이 생생이 그릇이 꾸는 다른 그릇들은	gwaegh 🙀 - Piloto en 196	
그 마음에 나타이 그 사고 환경이 많이 나를 때까지 어떻게 하였다.		
- 연필사회의 개인 전 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	나 보기를 하는 것은 그 사람들이 없다.	
그렇게 말하다면 하고 있다. 얼마나 아니라 나왔다면 다시했는데 모든 다.	그는 이 생물도 생각하는 이번 하는데 말	집에 집을 내렸는데 바셨다는 네
[2014] [2015] [1014] [1014] [2015] [2015] [2015] [2015] [2015] [2015] [2015] [2015] [2015] [2015] [2015] [2015]	도 없이 작용하였다는 이렇지 않았다.	
이 성관 회사 항상을 보는 이 사람이 하셨습니까요. 그 나는 이 다른 사람들이 다른 사람들이 되었다.	교내를 다 남아가게 시민하다.	
그러 했습니다 하는데요 사용하실, 이렇게 잃어들었다. 살아요.	지수는 얼마가 하는 것이 없다.	성 그 이 왕의 의탈를 하하는데
되는 말이 되자 그렇게 되었다고 있다. 이 대략에 얼굴을 모양했다고?	하는 사람들 사람이 그 사람이다.	
그는 그는 그릇, 그의 그의 하겠다. 생각이 날아가는 뭐가요? 하나 나는		
그 사람들 회사 전투 그를 모고 있다면 되는 그를 가지하고 그리고 있다.		
노력 없는 방법 발표를 보게 되는 그는 동선학자가 그리는 살았다.		
그는 그렇게 하다면 그러지 않는 수가 그는 형식도 하나 하는 것이다.		가는 사람이 아내면 어떻게 느꼈다.
고객들이 되었습니다. 하는 사람들은 사람들이 사고 있는 것이 되었습니다. 하는 사람들은 사람들이 사람들이 가장 사람들이 사고 있습니다.		
요즘 사는 발매하는 그 그 물에서 요즘가 하는 사람들을 통해 다했다.		
그는 말이 그렇게 먹다면서 어떻게 얼마나서 그렇지 얼마나왔다.	원 마시 그 맛을 봤다. 하셨다고 하다	
설계되다 얼룩하다 나는 하다 그렇게 되는 그는 나는 사람이 되었다. 뭐		
보이면 모르게 되고 있는데 이 보셨다면 얼마나 이 이 하는데 이렇게 됐다.		그러워서 이렇게 싫었다.
요하이 이 왜 하는데 물리를 하는 것을 보고 들었다. 나쁜 이 경험이 없다.	보이 되었다면 하게 되었다면 보다는 다양일이	기는 기본 어린 이동을 통했다. 그 연
		실내는 시장하는 시설속하는 그 )
여, 병이를 한 말았다. 그렇게 되는 사람들이 보는 이 이 보였다.	보이다 바람이 되는 이 나라를 통해된다.	시간을 시작되었다. 상황인 동안이 모나를
그는데 사람 하시를 하시다는 말 맛이 그렇다 살아왔습니다는 어떻게?		
이 병기는 그들이 되고 있는 모양이 이렇게 살았다면 되었다. 하다	기존 현사는 경찰에 그릇한 그 나 없	
마을 모기 가느(하는 맛이지) 본 시 하는 모든 이렇게 하셨는데 있다"를 모든록	로마막 회사를 가게 됐습니다. 그 없이 없다	
이 이에 살아 그리 같은 맛이 아이지 않는데 맛있다고 있다고 싶었다고 살았다.	레스의 이름 강성했다. 스펙스펙스트를	생활한 경기 발발생활동 보는 사람
그는 이 이번 사는 사람들이 없는 사는 그 이렇게 맞다면 살려면 있다.		
그는 6 이동말 이동의 하는 사용하다. 이 현리 생각 그는 제공하	불안하게 하는 하는 사람들이 모르셨다.	
그들도하다는 경우는 이름없다면 살아왔다고 있는 것이다.	이 젊었다면 되었다. 실험은 보안 이 날	
문화되었다. 그런 보고 보고 한 경험을 하고 했다. 말요요^^^ (L		
실진불인 가스 현실은 기록 전 가는 작은 그렇게 되어 가고 가고, 그는 사		할이들하는 하는 오랫테는 다
그 등이 있는데 이렇게 되었다면 돼요? 그리고 하셨다.		
그리는 이 그 사람이 있다는 것은 안 있는데 하는 것은 것은데		

### BEFORE THE DEPARTMENT OF ECOLOGY OF THE STATE OF WASHINGTON

AND THE

DEPARTMENT OF WATER RESOURCES
OF THE
STATE OF IDAHO

IN THE MATTER OF THE	)	
COORDINATED MANAGEMENT	)	INTERAGENCY AGREEMENT
OF THE PULLMAN-MOSCOW	)	
GROUND WATER AQUIFER	)	

WHEREAS, the ground water resource located in the Palouse River/Hangman Creek basins of Latah County, Idaho and Whitman County, Washington, is an important water source for citizens of both Washington and Idaho; and

WHEREAS, the Pullman-Moscow Water Resources Committee (PMWRC), made up of representatives from Whitman County, Latah County, City of Pullman, City of Moscow, Washington State University, and University of Idaho, has been established in recognition of local concerns for the safety and reliability of the ground water resource because of continuing declines in ground water levels in the Pullman-Moscow aquifer; and

WHEREAS, computer-simulated modeling studies sponsored by the PMWRC indicate that the ground water level declines will continue if annual rate of withdrawal from the aquifer increases; and

WHEREAS, applications filed in both Washington and Idaho in recent years for large withdrawals of water from the aquifer indicate the potential exists for substantially increased ground water withdrawals and an associated decline in ground water pumping levels; and

WHEREAS, the PMWRC has adopted a coordinated management plan which sets goals for improved management of the Pullman-Moscow aquifer and action plans aimed at achieving these goals have been adopted by each of the entities belonging to the PMWRC; and

WHEREAS, the Director of the Department of Ecology of the State of Washington is charged with the administration of ground water resources to maintain a safe sustained yield (Revised Code of Washington 90.44.130) and is authorized by Washington law to represent the state in matters pertaining to interstate water rights and water development; and

WHEREAS, the Director of the Department of Water Resources of the State of Idaho is charged with the administration of ground water to maintain reasonable pumping levels (Section 42-226, Idaho Code) and is authorized by Section 42-1805, Idaho Code to represent the state in matters pertaining to interstate water rights and water development; and

WHEREAS, the responsible officials of each state desire to achieve coordinated management of the ground water resources of the Pullman-Moscow aquifer in accordance with their respective state laws and in cooperation with the PMWRC and its member entities;

NOW, THEREFORE, IT IS HEREBY AGREED THAT administration of the ground water resources of the Pullman-Moscow aquifer will be in accordance with the adopted "Groundwater Management Plan" of the PMWRC to the extent that such plan can be implemented and administered under the laws of each state. The following specific actions will be taken by the administrative agency of each state to implement the plan:

- 1. Issuance of new permits to appropriate ground water and approval of applications to change existing ground water rights will be guided by the withdrawal limitations in the PMWRC plan. The state administrative agencies will provide copies of all such applications to the PMWRC for review and evaluation relative to compliance with the PMWRC plan. The decision-making authority rests with the state agency, but the recommendations of the PMWRC will be made part of the official record for each application.
- 2. Applicants proposing significant (as determined by the director of the state within which the application is filed) increases in withdrawal of ground water from the Pullman-Moscow aquifer will be required to provide information on alternative sources of water, conservation practices to be implemented to reduce the quantity of water withdrawn, and similar information needed to demonstrate compliance with the PMWRC plan.
- 3. Applications for transfer of ground water rights across the state line will be considered in accordance with the applicable laws of each state and will be guided by the PMWRC plan.
- 4. The administrative agency of each state will, within the funding available and the priorities set by the director of each state, endeavor to enforce the applicable laws of each state relative to supervision of construction and maintenance of wells, unauthorized diversion and use of water, and conservation of water to achieve the goals of the PMWRC plan.
- 5. Within funding specifically available for such purposes, the administrative agency of each state will cooperate in studies necessary to evaluate the ground water resource and improve management of it.
- 6. A representative of each agency will be designated by the director of each agency as responsible for coordination of the agency's activities with the PMWRC.

IT IS FURTHER UNDERSTOOD that this agreement is effective upon signature by both directors and accomplishment of such filing, notice or approval requirements as may be necessary. This agreement shall remain in effect until terminated by written notice by either party.

DATE: Apr. 18, 1992

FOR CHUCK CLARKE

DIRECTOR

WASHINGTON DEPARTMENT OF ECOLOGY

R. KEITH HIC

DIRECTOR

IDAHO DEPARTMENT OF WATER RESOURCES

## Appendix 6 Licelation of Licelation (Licelation)

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## RESOLUTION OF ACCEPTANCE between the parties of the PULLMAN-MOSCOW WATER RESOURCES COMMITTEE

#### 1992

WHEREAS, the Pullman-Moscow Water Resources Committee (hereinafter "PMWRC") composed of representatives of Pullman, Moscow, University of Idaho, Washington State University, Whitman County and Latah County (hereinafter "PARTIES") has an interest in the protection and management of the ground water resources of the Pullman-Moscow basin (hereinafter "BASIN"); and

WHEREAS, there is evidence to show that the potential exists for the overuse of quality groundwater resources within the basin; and

WHEREAS, a ground water management plan developed and implemented in concert with public needs and interests and in accordance with state and local laws, rules and regulations can serve to avert the overuse of the ground water resources in the basin; and

WHEREAS, a Groundwater Management Plan has been developed by the PMWRC; and

WHEREAS, the parties to this Resolution are desirous of implementing such a groundwater management plan; and

WHEREAS, parties hereto are authorized to enter into this Resolution of Acceptance for the purposes stated herein.

The PMWRC recommends the Groundwater Management Plan to the PARTIES for acceptance and implementation.

NOW THEREFORE BE IT RESOLVED, this Resolution shall be effective upon execution by all parties and accomplishment of the filing requirements and approvals as may be necessary. This Resolution shall remain in effect until any party to the agreement terminates its participation by written notice of termination to the other parties.

Chairman

Pullman-Moscow Water Resources Committee

Pullman Date

Date

| Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | Date | D